D9412G/D7412G Control/Communicators

Operation and Installation Guide

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Notes:

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Contents

1.0 Introduction 9
1.1 Manual Organization 9
1.2 Related Documentation 10
1.3 Documentation Conventions 10
1.3.1 Type Styles Used in the Text 10
1.3.2 Tips, Notes, Cautions and Warnings 11
1.4 FCC Rules 11
1.4.1 Part 15 11
1.4.2 Part 68 11
2.0 Overview 13
2.1 D9412G/D7412G Differences 13
2.2 Specifications 14
2.3 New Features in D9412G/D7412G 16
2.3.1 Introduction 16
2.3.2 Ground Fault Detect 16
2.3.3 Added Feature When Using Ground Fault Detect 16
2.3.4 NetCom Functionality 16
2.4 Standard Features 16
2.4.1 Points 16
2.4.2 Areas and Accounts 16
2.4.3 Communicator 16
2.4.4 Command Centers 17
2.4.5 Keyswitch 17
2.4.6 Access Control 17
2.4.7 Event Memory 17
2.4.8 Event Log 17
2.4.9 EMI & Lightning Transient Protection 18
2.4.10 Programming 18
2.4.11 Other Features 18
2.4.12 Control/Communicator Assembly 18
2.4.13 Available by Separate Order 18
2.4.14 Listings and Approvals 19
3.0 Installation 21
3.1 Before Beginning 21
3.2 Enclosure Options 21
3.3 Beginning the Installation 21
3.4 Installing the Assembly 22
3.5 Connecting Earth Ground 22
3.5.1 Terminal 10 22
3.5.2 Ground Fault Detect Enable 22
3.5.3 Locking the Reset Pin 22
3.6 Finishing the Installation 23
3.6.1 Charge the Battery While Finishing 23
3.6.2 Install and Wire Detection Devices 23
3.6.3 Install Modules and Relays 23
3.6.4 Make the Telephone Connections 23
3.6.5 Connect the On-board Points and Command Centers 23
3.6.6 Power Up 24

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Contents

3.7 Programming the Panel 24
3.8 Install the Point Chart Label 24
3.9 Testing the System 24
4.0 Power Supply 25
4.1 Primary Power Terminals ① ② 25
4.1.1 Primary (AC) Power Circuit 25
4.1.2 Installing the Transformer 25
4.2 Secondary Power Terminals ❹ ⑤ 25
4.2.1 Secondary (DC) Power 25
4.2.2 Installing the Battery 25
4.2.3 Replacing the Battery 26
4.2.4 Battery Supervision 27
4.2.5 Battery Charging Circuit 27
4.2.6 Battery Discharge/Recharge Schedule 28
4.3 Charging Status and Low Battery LEDs 28
5.0 Power Outputs 29
5.1 Circuit Protection 29
5.2 Total Available Power 29
5.3 Continuous Power Outputs Terminals ③ ㉔ ㉜ 29
5.3.1 Continuous Current Draw 29
5.4 Programmable Power Outputs Terminals ⑥ ⑦ ⑧ 29
5.4.1 Programming 29
5.4.2 Optional Relays Required 30
5.4.3 Terminals 6 and 7 30
5.4.4 Fire System Power Formula 30
5.4.5 Terminal 8 31
6.0 Telephone Connections 33
6.1 Registration 33
6.2 Notification 33
6.3 Location 33
6.4 Phone Cord Connection 33
6.5 Phone LED (Red) 33
6.6 Operation Monitor LED (Green) 34
6.7 Dialing Format 34
6.8 Phone Line Monitor 34
6.9 Called Party Disconnect 34
6.10 Communication Failure 34
6.10.1 Enhanced Communication 34
6.11 Ground Start 35
6.11.1 Relay Installation 35
6.11.2 Phone Monitor Select Jumper 35
6.12 D928 Dual Phone Line Switcher 35
6.12.1 Description 35
6.12.2 Operation 35
6.12.3 Watchdog Feature 36

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Contents

6.12.4 Installing the D928 36
6.12.5 D928 Status LEDs 36
7.0 On-board Points 37
7.1 Description Terminals ⑪ to ㉒ 37
7.2 Point Sensor Loops 37
7.3 Point Parameters 37
7.4 Point Response Time 37
7.5 Wiring Information for Installations using the Ademco AB-12 Bell/Housing 38
8.0 Off-board Points 39
8.1 Point (ZONEX) Bus D9412G Terminals ㉓ to ㉘ D7412G Terminals ㉗ to ㉘ 39
8.2 D8125, D8127 and D9127 POPIT Modules 39
8.2.1 Listings 39
8.3 Installing the D8125 POPEX Module 42
8.3.1 Mounting 42
8.3.2 Wiring the D8125 to the Control/Communicator 42
8.3.3 Wiring POPITs to the Data Expansion Loop 42
8.3.4 Wiring Data Expansion Loops to POPEX Modules 43
8.3.5 POPIT Sensor Loops 43
8.3.6 POPIT Module Point Assignments 43
8.3.7 Program Record Sheet 43
8.4 D8128D OctoPOPIT Module 44
8.4.1 Description 44
8.4.2 Listing 44
8.4.3 Installing the OctoPOPIT 45
8.4.4 Wiring OctoPOPITs 45
8.4.5 Line Termination 45
8.4.6 OctoPOPIT Sensor Loops 46
8.4.7 Address Assignment Switches 46
8.5 Testing Off-board Points 46
9.0 Off-board Relays 49
9.1 D8129 OctoRelay 49
9.1.1 Configuring the D8129 OctoRelay 49
9.1.2 Relay Outputs 49
9.1.3 Installation 49
9.1.4 Wiring Connections 49
9.2 D811 Arm Status Relay Module 51
9.2.1 Relay Output 51
9.2.2 Installation 51
9.2.3 Wiring Connections 51
10.0 Arming Devices 53
10.1 Description 53
10.2 Command Center Terminals ㉙ to ㉜ 53
10.2.1 Assigning the command center an address 53
10.2.2 Installation 53
10.3 D268/D269 Independent Zone Control, D279A Independent Zone Control . 54

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Contents

10.4 Keyswitch 55
10.4.1 Description 55
10.4.2 Programming 55
10.4.3 Installation 55
10.4.4 Keyswitch Operation 55
11.0 SDI Devices 57
11.1 Description 57
11.2 Installation 57
11.3 D9131A Parallel Printer Interface Module 57
11.3.1 Switch Settings 57
11.3.2 Supervision 57
11.4 D9210B Wiegand™ Control Interface Module 58
11.4.1 Switch Settings 58
11.5 SDI Address 80 58
11.5.1 D9133 Serial Interface Module 58
11.5.2 Address Settings 58
11.5.3 Supervision 58
11.6 SDI Address 88 59
11.6.1 D9133DC Direct Connect Programming Module 59
11.6.1.1 Connecting the D9133DC 59
11.6.1.2 Used as an External Modem 59
11.6.2 D9133TTL-E Network Interface Module 59
11.6.3 Address Settings 59
11.6.4 Supervision 59
12.0 Programmer and Accessory Connections 61
12.1 Programmer Connector 61
12.1.1 Programmer Access Reports 61
12.2 Accessory Connector 61
13.0 Faceplates 63
13.1 D9412G Faceplate 63
13.2 D7412G Faceplate 64
Appendix A: System Wiring Diagrams, Issue A 65
A.1 D9412G Control/Communicator, 1 of 3 65
A.2 D9412G Control/Communicator, 2 of 3 66
A.3 D9412G Control/Communicator, 3 of 3 67
A.4 D7412G Control/Communicator, 1 of 3 68
A.5 D7412G Control/Communicator, 2 of 3 69
A.6 D7412G Control/Communicator, 1 of 3 70
Appendix B: Point Address Charts 71
B.1 ZONEX 1, Points 9 to 127 (D9412G); ZONEX 1, Points 9 to 75 (D7412G) 71
B.2 ZONEX 2, Points 129 to 247 (D9412G Only) 72

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Contents

Figures:

Figure 1: System Configuration 13
Figure 2: Enclosure Mounting 21
Figure 3: Ground Fault Detect 22
Figure 4: Reset Pin 22
Figure 5: Non Power Limited Wiring 26
Figure 6: Charging and Battery LEDs 28
Figure 7: Relays for Terminals 7 and 8 and Ground Start 31
Figure 8: RJ31X Wiring 32
Figure 9: Phone Connector and LED and Operation Monitor LED Locations 33
Figure 10: Phone Monitor Select 34
Figure 11: D928 Dual Phone Line Switcher 36
Figure 12: On-board Point Sensor Loop Wiring 37
Figure 13: Wiring for Installations using the Ademco AB-12 Bell/Housing 38
Figure 14a: Connecting the D8125 POPEX to the D9412G Panel 40
Figure 14b: Connecting the D8125 POPEX to the D7412G Panel 41
Figure 15: Program Record Sheet 44
Figure 16a: Connecting D8128D OctoPOPITs to the D9412G 47
Figure 16b: Connecting D8128D OctoPOPITs to the D7412G 48
Figure 17b: D8129 Connections to the D7412G 50
Figure 17a: D8129 Connections to the D9412G 50
Figure 18a: D811 Module Wiring to the D9412G 51
Figure 18b: D811 Module Wiring to the D7412G 52
Figure 19: Power at Command Centers 54
Figure 20: Keyswitch Wiring 55
Figure 21: Reset Pin 61
Figure 22: Programmer and Accessory Connections 61
Figure 23a: D9412G Faceplate 63
Figure 23b: D7412G Faceplate 64
Figure 24a: D9412G System Wiring Diagram, 1 of 3 65
Figure 24b: D9412G System Wiring Diagram, 2 of 3 66
Figure 24c: D9412G System Wiring Diagram, 3 of 3 67
Figure 25a: D7412G System Wiring Diagram, 1 of 3 68
Figure 25b: D7412G System Wiring Diagram, 2 of 3 69
Figure 25c: D7412G System Wiring Diagram, 3 of 3 70

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Contents

Tables:

Table 1: D9412G/D7412G Operation and Installation Guide Organization 9
Table 2: Related Documentation 10
Table 3: Differences Between the D9412G and D7412G 13
Table 4: Specifications 14
Table 5: Compatible Command Centers 17
Table 6: Listings 19
Table 7: Charging Status and Low Battery LEDs 28
Table 8: Data Expansion Loop Wire Specifications 42
Table 9: D8128D OctoPOPIT Switch Settings for D9412G/D7412G 46
Table 10: D8129 OctoRelay Switch Settings 49
Table 11: Number of D8128Ds used with D8129s 50
Table 12: Command Center Address Settings 53
Table 13: Command Center Connections 53
Table 14: SDI Device Connections 57
Table 15: Printer Address Switch Settings 57
Table 16: Access Control Module Address Switch Settings 58
Table 17: ZONEX 1 Point Address Chart 71
Table 18: ZONEX 2 Point Address Chart 72

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1.0 Introduction

This manual addresses the operation and installation of the D9412G/D7412G Control/Communicators **only**, and should not be used in conjunction with the D9412, D9112, D9112B1, D7412, D7212 or D7212B1 panels.

Throughout this manual, unless expressly stated, the words “panel” and “control/communicator” refer to both panels (D9412G and D7412G).

Section *2.1* provides an overview of the differences between the D9412G and D7412G panels.

1.1 Manual Organization

This manual is divided into sections and appendices, summarized in the table below.

Section	Description
1	**Introduction** – provides information on the structure of the manual, lists other literature related to these Control/Communicators, and describes the FCC rules with which they comply.
2	**Overview** – provides an overview of the D9412G/D7412G Control/Communicator panels, including operational specifications, standard and new features.
3	**Installation** – provides installation instructions for connecting the power terminals plus the status and battery LEDs.
4	**Power Supply** – provides information on the primary and secondary modules and instructions on connecting and programming them.
5	**Power Outputs** – provides information on the power outputs and instructions on installing the transformer; explains the status and battery LEDs.
6	**Telephone Connections** – provides information on connecting the phone line and programming it for use.
7	**On-Board Points** – provides information on the on-board points and their parameters.
8	**Off-Board Points** – provides information on the off-board points and their parameters, including the installation, wiring and testing of OctoPOPITs.
9	**Off-Board Relays** – describes the installation and wiring of the D8129 OctoRelay and the D811 Arm Status Relay Module.
10	**Arming Devices** – describes the installation, wiring, programming and operation of independent zone control modules.
11	**SDI Devices** – provides a description and installation instructions for various SDI device modules.
12	**Programmer and Accessory Connections** – describes the Programmer Connector and the Accessory Connector.
13	**Faceplates** – provides an illustration of each of the panels (D9412G and D7412G).
Appendix	***Description***
A	**System Wiring Diagrams** – illustrations showing the terminal wiring connections for each of the panels.
B	**Point Address Charts** – provides ZONEX point addresses for POPITS.

Table 1: D9412G/D7412G Operation and Installation Guide Organization

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1.2 Related Documentation

Shown below is a comprehensive list of all documentation (with part numbers) directly related to the D9412G/D7412G Control/Communicator panels. Throughout this manual, references are made to this documentation. If it is necessary to obtain one (or more) of these documents, please contact Radionics Technical Support and request the documentation by its corresponding part number.

Name of Documentation	Part Number
D1255 Installation Instructions	74-06819-000
D1256/D1257 Installation Instructions	74-06925-000
D1260 Installation Guide	48101
D1260 Owner's Manual	50410
D5200 Operation Manual	74-06176-000
D720 Installation Instructions	74-06918-000
D7412G Release Notes	43856
D8125MUX Operation & Installation Guide	36796
D9210B Operation and Installation Guide	32206
D9412G Release Notes	43821
D9412G/D7412G Approved Applications Compliance Guide	43494
D9412G/D7412G Installation and Troubleshooting Quick Reference Guide	43700
D9412G/D7412G New Features	43746
D9412G/D7412G Operation and Installation Guide (this manual)	43488
D9412G/D7412G Point Chart Label	79-06660-000
D9412G/D7412G Program Entry Guide	47775
D9412G/D7412G Program Record Sheet	47488
RAM IV Operations Manual	38849
Security System Owner's Manual	71-06633-000
Security System Owner's Manual Supplement	33267
UL Certificated Bank Safe and Vault Applications Technogram	73-07302-000
9000/9000G Series Smoke Detector Compatibility List	33284

Table 2: Related Documentation

1.3 Documentation Conventions

1.3.1 Type Styles Used in the Text

Special type styles are used to help identify the objects being described in this guide.

Bold text	usually indicates selections that you may use while programming your panel. It may also indicate an important fact that should be noted.
Bold Italicized	used to denote notes, cautions and/or warnings
Italicized text	Is used to reference the user to another part of this manual or another manual entirely. It is also used to symbolize names for records that the user will create.
`Courier Text`	Text that appears like this indicates what may appear on the D5200 Programmer display, command center/keypad or internal printer.
[CAPITALIZED TEXT]	Text like this is used to indicate to the user that a specific key should be pressed.

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1.3.2 Tips, Notes, Cautions and Warnings

Throughout this document helpful tips and notes will be presented concerning the entire application and/or programming the unit. They will be set off as follows:

Warning! There is the possibility of physical damage to the operator, equipment and/or proper execution of the program.

Caution! Cautions the operator that physical damage to the equipment or improper execution of the program may occur.

Important Notes should be heeded for successful operation and programming. Helpful tips and/or shortcuts may be included here.

1.4 FCC Rules

1.4.1 Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

1.4.2 Part 68

This equipment complies with Part 68 of FCC rules. A label contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.

The Radionics D9412G/D7412G Control/Communicators are registered for connection to the public telephone network using an RJ38X or RJ31X jack.

The ringer equivalence number (REN) is used to determine the number of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5). To be certain of the number of devices that may be connected to the line, as determined by the RENs, contact the telephone company to determine the maximum REN for the calling area.

If trouble is experienced with the D9412G/D7412G Control/Communicators, please contact Radionics Customer Service for repair and/or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request that the equipment be removed from the network until the problem is resolved. User repairs must not be made, and doing so will void the user's warranty.

If the D9412G/D7412G Control/Communicators cause harm to the telephone network, the telephone company will attempt to notify you in advance. If advance notice isn't practical, the telephone company will notify you as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for the necessary modifications to be made in order to maintain uninterrupted service.

This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line service is subject to state tariffs. (Contact your state public utilities commission for information.)

FCC Registration Number:	AJ9MUL-46532-AL-E	Service Center in USA:	National Repair Center 130 Perinton Parkway Fairport, NY 14450 (585) 223-4220
Ringer Equivalence:	0.1B		

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2.0 Overview

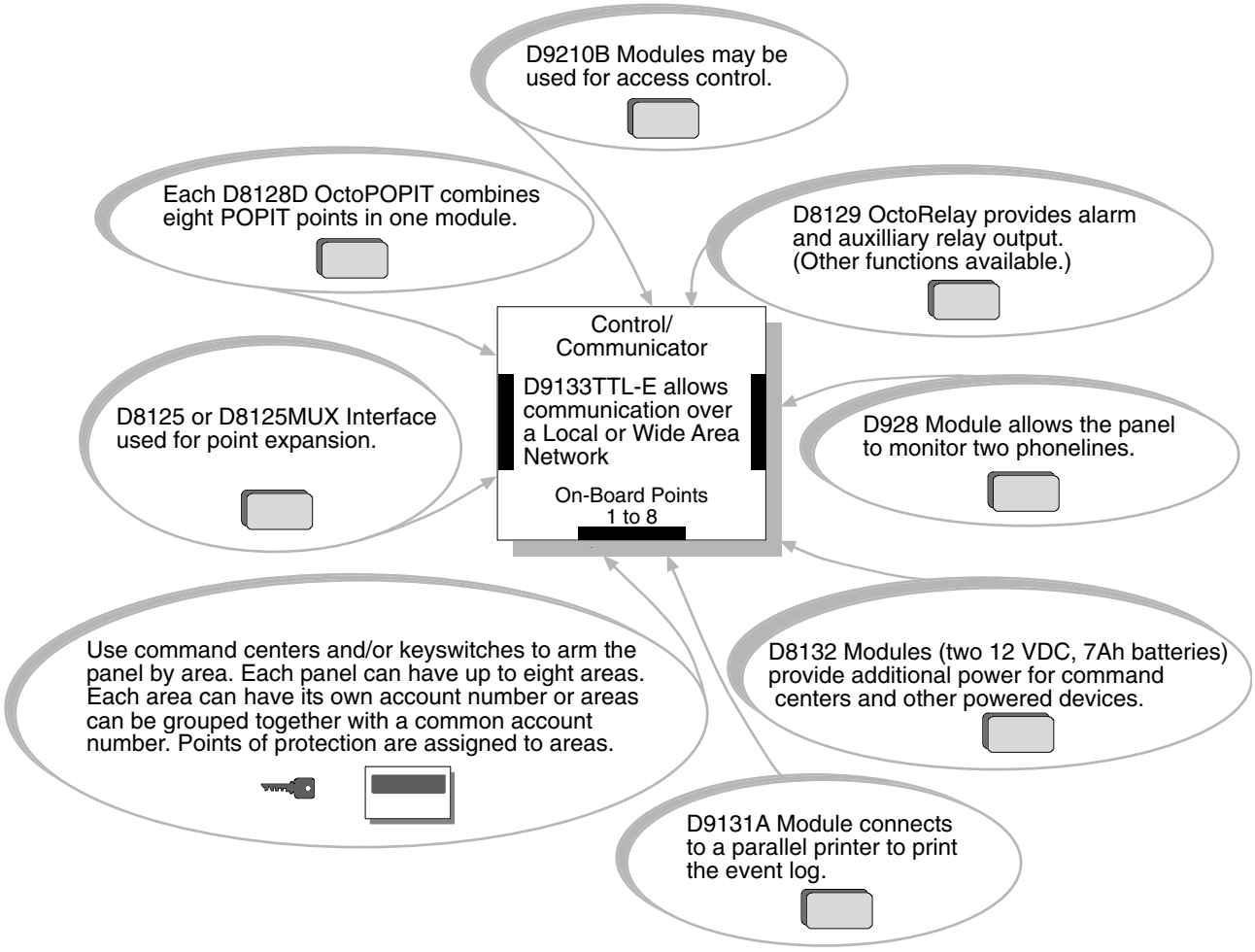
D9210B Modules may be used for access control.
Each D8128D OctoPOPIT combines eight POPIT points in one module.
D8129 OctoRelay provides alarm and auxilliary relay output. (Other functions available.)
Control/ Communicator
D9133TTL-E allows communication over a Local or Wide Area Network
On-Board Points 1 to 8
D8125 or D8125MUX Interface used for point expansion.
D928 Module allows the panel to monitor two phonelines.
Use command centers and/or keyswitches to arm the panel by area. Each panel can have up to eight areas. Each area can have its own account number or areas can be grouped together with a common account number. Points of protection are assigned to areas.
D8132 Modules (two 12 VDC, 7Ah batteries) provide additional power for command centers and other powered devices.
D9131A Module connects to a parallel printer to print the event log.

Figure 1: System Configuration

2.1 D9412G/D7412G Differences

The table below provides an overview of the differences between the D9412G and D7412G panels.

New Features	D9412G	D7412G
Access Control	YES, 8 Doors	YES, 2 Doors
Expanded Users Arm/Disarm Passcodes Cards/Tokens	 249 996	 99 396
Passcode-Protected Custom Functions	16	4
Number of Printers	3	1
Number of Points	246	75
Number of Relays	128	64

Table 3: Differences Between the D9412G and D7412G

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2.2 Specifications

(The black and white circles with numbers indicate the specific panel terminal.)

Voltage Input (Power Supply)	**Primary:**	① ②	16.5 VAC 40 VA class 2 plug-in transformer (D1640)
	Secondary:	④ ⑤	Sealed lead-acid rechargeable (12 VDC, 7 Ah or 12 VDC, 17.2 or 18 Ah) battery. The panel supports a maximum of two 12 VDC, 7 Ah batteries using the D122 Dual Battery Harness or two D1218 (12 VDC, 17.2 or 18 Ah) batteries using a D122.
Current Requirements	Panel : 500 mA alarm, 200 mA idle See *Current Rating Chart for Standby Battery Calculations* in *the D9412G/D7412G Approved Applications Compliance Guide* for the current draw requirements of other system components.		
Power Outputs	All external connections are inherently power-limited except battery terminals.		
	Continuous Power Outputs	③ ㉔ ㉜	1.4 A maximum at 10.2 VDC to 13.9 VDC (continuous supply) total for all devices and outputs supplied at Terminals 3, 24, and 32 and at the Accessory and Programming Connectors.
	Alarm Power Output	⑥ ⑦	2.0 A maximum at 10.2 VDC to 13.9 VDC output. Output may be steady or one of three pulsed patterns depending on programming. See *Relays* in the *D9412G/D7412G Program Entry Guide*.
	Switched Aux Power	⑧	1.4 A maximum at 10.2 VDC to 13.9 VDC output. Continuous output is interrupted by Sensor Reset or alarm verification depending on programming. See *Relays* in the *D9412G/D7412G Program Entry Guide*.
	Fire and Fire/Burglary Systems	To comply with UL 985 and 864 listing standards for fire alarm systems (effective March 1, 1989), the total combined continuous and alarm current draw for the system **during alarm conditions** must be limited to 1.4 A (1400 mA) provided by the primary power supply (rectified AC). If current draw for the system exceeds 1.4 A, remove connected devices until the current draw falls below 1.4 A, then connect the removed devices to a D8132 Battery Charger Module or to an external power supply (see *Figure 19*).	
Minimum Operating Voltage	10.2 VDC		
SDI Bus	**SDI Bus A (+):** **SDI Bus B (-):**	9 VDC (15,000 ft. [4,572 m] max.) 9 VDC (15,000 ft. [4,572 m] max.)	
Telephone Connections	**Connection** **Two TelCo Lines**	RJ31X or RJ38X jack can be interfaced with the panels. Radionics D928 Dual Phone Line Module required for two phone line service. Supervision supplied by the panel.	

Table 4: Specifications

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Battery Dischrge/Recharge Schedule	**Discharge Cycle**	13.9 VDC	Charging float level
		13.8 VDC	Charging Status LED on
		12.1 VDC	Low Battery & AC Fail reports if programmed, Low Battery LED on
		10.2 VDC	Battery load shed (processing functions continue if AC is present)
	Recharge Cycle	AC ON	Load shed relay resets battery charging begins, Battery Trouble and AC Restoral reports sent.
		13.7 VDC	Battery Restoral report sent, Low Battery LED off
		13.9 VDC	Charging Status LED off, battery float charged
Environmental	**Temperature:**	+32°F to +122°F (0°C to +50°C)	
	Relative Humidity:	5% to 85% at +86°F (+30°C) non-condensing	
Arming Stations	D1255 Command Center; D1256 Fire Command Center; D1257 Fire Alarm Annunciator; D1260 Alpha V Command Center; D720 Command Center; Keyswitch		
Point Thresholds	**On board Points 1 to 8**		

	Voltage	Resistance
Normal	2.3	1 kΩ
Short	1.85	0.657 kΩ
Open	2.93	1.6 kΩ

Compatible Enclosures	D8103 Universal Enclosure, D8109 Fire Enclosure, D8108A Attack Resistant Enclosure		

Table 4 (cont'd): Specifications

Compatible Accessories

See the Radionics Product Catalog for a complete list.

D122	Dual Battery Harness
D125B	Powered Loop Interface Module
D126	12 V, 7 Ah Rechargeable Battery
D127	Reversing Relay
D129	Dual Class A Initiation Circuit Module
D130	Relay Module
D136	Plug-In Relay
D161	Phone Cord
D162	Phone Cord
D185	Reverse Polarity Module
D192C/D192D	Bell Circuit Supervision Module
D268/D269	Independent Zone Control (On-Board and OctoPOPIT points)
D279A	Independent Zone Control (On-Board and OctoPOPIT points)
D442	Bells (10-inch)
D448/D449	Mini-Horns
D720	Command Center (Area LED)
D720R	LED Command Center (red)
D720W	LED Command Center (white)
D928	Dual Phone Line Switcher
D1218	12 V, 17.2 Ah Rechargeable Battery
D1255	Command Center (General Purpose)
D1255R	Command Center (red)
D1255W	Command Center (white)
D1256	Fire Command Center
D1257	Fire Annunciator
D1640	16.5 VAC 40 VA Transformer
D5200	Programmer
D5500	Remote Account Manager IV
D8004	Transformer Enclosure
D8121A, D8122	Derived Channel S.T.U.
D8125	POPEX Module
D8125MUX	Multiplex Bus Interface
D8125INV	Wireless Interface Module
D8128D	OctoPOPIT Module
D8129	OctoRelay Module
D8130	Release Module
D8132	Battery Charger Module
D9002-5	Accessory Module Mounting Skirt
D9127U/T	POPIT Module
D9131A	Parallel Printer Interface Module
D9210B	Access Control Interface Module
ZX776Z	PIR Motion Sensor (50 ft.) with POPIT
ZX794Z	PIR Motion Sensor (80 ft.) with POPIT
ZX835	PIR/Microwave Motion Sensor (35°) with POPIT
ZX938Z	PIR Motion Sensor (60 ft.) with POPIT
ZX970	PIR/Microwave Motion Sensor (35°) with POPIT

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2.3 New Features in D9412G/D7412G

2.3.1 Introduction

The D9412G is intended to eventually replace the D9412 and D9112. The D7412G will eventually replace the D7412 and D7212. The suffix “G” indicates the control/communicator’s ability to detect ground fault conditions. All other software feature sets that were available in the 9000 Series Control/Communicators have remained the same in the D9412G/D7412G.

2.3.2 Ground Fault Detect

In order for the D9412G/D7412G to be able to detect ground fault conditions, the Earth Ground Terminal on the control/communicators had to be electrically-isolated from all other terminals. A Ground Fault Detect Enable switch (S4) has been added to the panel and is located just under Terminal 10, Earth Ground. For more information on the operation of this function, see section *3.5.2 Ground Fault Detect Enable*.

2.3.3 Added Feature When Using Ground Fault Detect

When Ground Fault Detect is enabled (S4 closed), Points 1-8 can be used for non-powered fire-initiating devices, such as Heat Detectors, 4-Wire Smoke Detectors, Pull Stations, etc. A D125B Powered Loop Interface or a D129 Dual Class A Interface Module is no longer required when connecting non-powered fire-initiating devices to Points 1-8.

2.3.4 NetCom Functionality

The D6600 NetCom System supports data network communications. NetCom allows the D6600 Receiver to connect to various network topologies, specifically Ethernet and Token Ring, and to process messages both to and from most networks using TCP/IP protocols. Connection to a data network can be implemented through the use of the COM4 and/or a COM1 connection from the D6600 Receiver to the D6680 Network Adapter. Reports from alarm control panels via phone lines OR Ethernet and Token Ring data networks can be sent to the D6600 Receiver and onto the central station automation software and/or the network printer via LAN or WAN. Alarm control panels can be monitored on the network for their status.

2.4 Standard Features

2.4.1 Points

The Radionics D9412G Control/Communicator panel provides up to 246 points of protection, and the D7412G Control/Communicator provides up to 75 points of protection. Point programming parameters determine the panel’s response to open and shorted conditions on the point’s sensor loop. Points are programmed individually with several options to custom-fit the protection to the installation.

Points 1 to 8 are located on the circuit board (on-board points). They are standard sensor loops. The remaining off-board points are POPIT points using D8128D OctoPOPITs, D8125 POPEX Modules and D9127/D8127 POPITs.

2.4.2 Areas and Accounts

The system supports up to eight separate areas. All points can be assigned to a single area or spread out over up to eight areas.

The panel is armed and disarmed by area, and several areas can be armed and disarmed with one menu function. A passcode can also be assigned an authority level that allows a user to arm an area from a remote command center in another area. Assigning each area its own account number creates eight separate accounts in one panel. Assigning the same account number to different areas groups them together in a single account.

Area options include: exit tone and delay, separate fire and burglary outputs, and multiple opening and closing windows. Area type can be used to create area interdependencies.

2.4.3 Communicator

The control/communicator uses a built-in digital communicator to send reports to the receiver. The panel transmits reports in either the Modem IIIa^2 or BFSK format. The D6500 receiver's MPU and line cards must have software revision 8.00 (or greater) installed to accept Modem IIIa^2 reports from the panel. Cycle the receiver’s down to print the software revision numbers.

The panel connects to an RJ31X or RJ38X jack for phone line seizure. Connection to the RJ31X complies with FCC regulations for using the public telephone network. The panel can be programmed to direct reports to four separate phone numbers. Adding the D928 Dual Phone Line Switcher Module allows connection and supervision of a second phone line.

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The system has routing capabilities that allow groups of event reports to be directed to four different destinations. Each of the report groups can be programmed to report to one or more of the destinations. Primary and backup reporting paths can be programmed for each of the destinations and each of the report groups. A custom option allows specification of individual event reports to be sent.

2.4.4 Command Centers

A maximum of 32 unsupervised command centers can be connected to the system. The available power, number of supervised command centers, and number of areas that will be used, affect the total number of command centers that can be connected.

The system can supervise up to 8 command centers. The panel transmits a serial device trouble report `SDI`

Model	Display	Application
D1255	16-character alphanumeric	Fire/Burglary/Access
D1256	16-character alphanumeric	Fire
D1257	16-character alphanumeric	Fire
D1260	4-line by 20-character alphanumeric	Fire/Burglary
D720	8 LED	Fire/Burglary

`FAILURE` in the Modem IIIa^2 format or `TROUBLE ZN D` in the BFSK format, if it loses communication with a supervised command center. More command centers can be added, but only eight can be supervised. *Table 5* shows the command centers compatible with the D9412G/D7412G Control/Communicators. See *Command Center* in the *D9412G/D7412G Program Entry Guide* for complete details on programming command center options.

Table 5: Compatible Command Centers

2.4.5 Keyswitch

Any of the eight available areas can be armed and disarmed with maintained or momentary closure devices such as keyswitches. Point programming determines loop responses and which area a keyswitch controls.

2.4.6 Access Control

The D9412G can control eight access doors (each requiring the optional D9210B Wiegand™ Control Interface Module) with up to 996 uniquely identified cards/tokens. The D7412G can control two access doors with up to 396 uniquely identified cards/tokens. Access can be granted from a Wiegand style access control device (card reader) connected to the D9210B Access Control Interface Module. Access may also be granted from a “request to enter” or a “request to exit” input, or from a command center.

The access control features of the D9412G/D7412G can deny access during armed periods. It can also grant access only to certain authorized users depending on whether the area is master armed, perimeter armed, or disarmed. The alarm system can also be programmed to automatically disarm when designated authorized users are granted access.

2.4.7 Event Memory

The system uses event memory to store events for each area. The events for an area can be viewed at a D1255 Command Center assigned to the area. The panel clears the events for an area from event memory and starts storing new events when the area is master armed.

2.4.8 Event Log

The system stores from 500 to 1,000 events and event modifiers from all areas in its event log. Event modifiers add information about an event to the log. Some events are always followed by a modifier. For example, the system adds at least two items to the log each time an area is armed or disarmed, the open (or close) event and an event modifier showing the previous arming state.

All events and their modifiers can be stored even if the panel does not send a report for them. The log can be viewed at a Command Center, printed locally using the D9131A Parallel Printer Interface Module and a parallel printer, or uploaded to the Remote Account Manager (RAM IV).

See the appendix in the Command Center’s *User’s Guide* for a listing of log events and event modifiers.

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2.4.9 EMI & Lightning Transient Protection

The D9412G/D7412G Control/Communicators maintain the Radionics high level of quality and field dependability. Their design significantly reduces electromagnetic interference and malfunction generally caused by lightning.

2.4.10 Programming

Use either the Radionics D5200 Programmer or the Remote Account Manager (RAM IV) to program the D9412G/D7412G Control/Communicators. Refer to the *D9412G/D7412G Program Entry Guide* for programming options.

2.4.11 Other Features

The D9412G/D7412G Control/Communicators have many programmable features. A short list of some of the features follows. Complete details on all the features can be found in the *D9412G/D7412G Program Entry Guide.*

- Supervision of AC (primary power), battery (secondary power), ZONEX and SDI buses, the CPU (Central Processing Unit), up to three printers, and two telephone lines
- Automatic system test reports
- Remote access for programming, diagnostics, and log uploads using the Remote Account Manager (RAM IV)
- Fire Alarm Verification
- Programmable Alarm Output
- Programmable Relay Output using the D8129 OctoRelay Module
- Opening and Closing Windows
- Skeds (scheduled events)

2.4.12 Control/Communicator Assembly

The D9412G/D7412G Control/Communicator is shipped pre-assembled from the factory with the following parts:

- **Literature Pack**
  - *D9412G/D7412G Installation and Troubleshooting Quick Reference Guide*
  - *D9412G/D7412G Program Record Sheet*
  - *UL Smoke Detector Compatibility Technogram*
  - *Point Chart Label*
- **Assembly**
  - PC board
  - Faceplate shield
  - Mounting Skirt
  - One #6x1/4" screw

2.4.13 Available by Separate Order

- **Separately Ordered Components** - Order the following to complete a basic 8 point installation.
  - D1255, D1256, D1257, D1260, or D720 Command Center (or keyswitch)
  - D1640 Transformer
  - D126 or D1218 Battery
  - D161 or D162 Phone Cord (order two cords if using the D928 Dual Phone Switcher)
  - D8103, D8108A, or D8109 Enclosure

Configured packages are also available. Please consult the Radionics Product Catalog.

- **Separately Ordered Literature** - The following literature is available in a separate literature package for dealers.
  - *D9412G/D7412G Operation and Installation Guide*
  - *D9412G/D7412G Approved Applications Compliance Guide*
  - *D9412G/D7412G Program Entry Guide*
  - *D9412G/D7412G Program Record Sheet*

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2.4.14 Listings and Approvals

The D9412G/D7412G Literature Pack includes the *D9412G/D7412G Approved Applications Compliance Guide*. Refer to this guide for additional guidelines for installing the control/communicator in UL and Fire specific applications.

Fire	
UL	Underwriters Laboratories lists the D9412G/D7412G Control/Communicators as Signal System Control Unit for: Central Station, Local, Auxiliary, Remote Station, and Household Fire Warning.
CSFM	Approved by the California State Fire Marshal for highrise and non-highrise.
Burglary	
UL	Underwriters Laboratories lists the D9412G/D7412G Control/Communicators for: Central Station, Local, Police Connect, Bank Safe and Vault, Mercantile Safe and Vault, and Grade A Household systems, Access Control, and Proprietary.
Department of Defense (DOD)	The D9412G/D7412G Control/Communicators have been granted approval for Department of Defense (DOD) installations in Sensitive Compartmented Information Facilities (SCIF).

Table 6: Listings

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Notes:

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3.0 Installation

3.1 Before Beginning

This *Installation* section contains a general installation procedure. It provides references to other sections of the manual for detailed instructions.

Radionics recommends a review of this manual and the *D9412G/D7412G Program Entry Guide* before beginning the installation to determine the hardware and wiring requirements for the features that will be used.

Have the following additional documents available when reading through this manual:

- *D9412G/D7412G Program Record Sheet*
- *Security System Owner's Manual* and *Security System Owner's Manual Supplement*
- *Command Center Installation Manual (D1255, D1256, D1257, D1260, or D720)*

Before beginning the installation, become familiar with the operation of the D5200 Programmer or the Remote Account Manager (RAM IV).

3.2 Enclosure Options

Mount the control/communicator assembly in any of the Radionics enclosures listed below. Refer to the *D9412G/D7412G Approved Applications Compliance Guide* to determine if the application requires a specific enclosure.

- D8103 Universal Enclosure (tan)
- D8109 Fire Enclosure (red)
- D8108A Attack Resistant Enclosure (tan)

3.3 Beginning the Installation

1. Mount the enclosure in the desired location. Use all five mounting holes. See *Figure 2*.

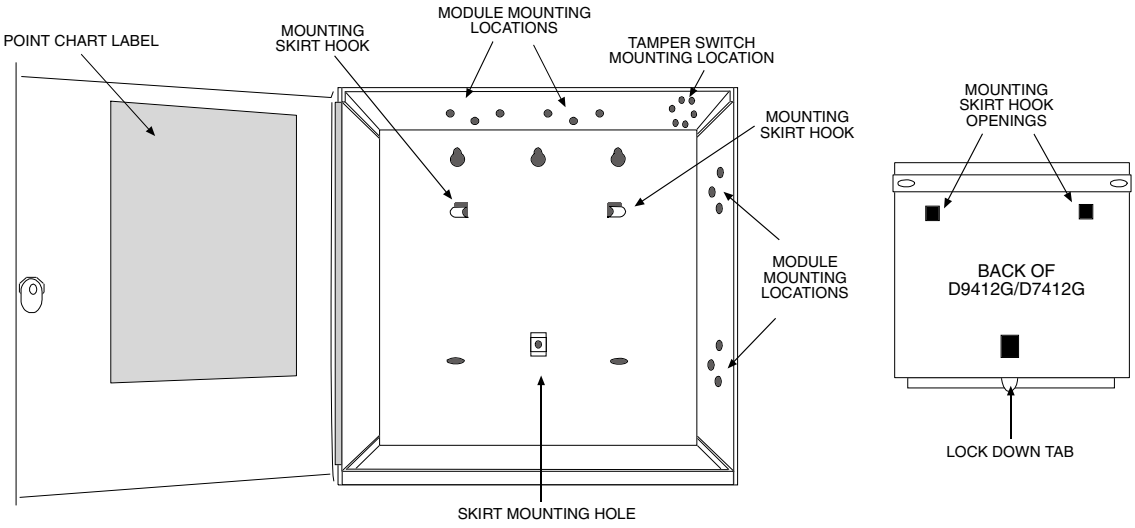

Figure 2: Enclosure Mounting

2. Run the necessary wiring throughout the premises and pull the wires into the enclosure.

EMI (Electro Magnetic Interference) may cause problems: Refer to *EMI on Long Wire Runs* in the *D9412G/D7412G Installation and Troubleshooting Quick Reference Guide.*

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3.4 Installing the Assembly

1. Place the assembly over the inside back of the enclosure, aligning the large rectangular openings of the mounting skirt with the mounting hooks of the enclosure. Slide the assembly down so it hangs on the hooks. See *Figure 2*.
2. Remove the tape from the #6x1/4-inch screw in the mounting tab on the assembly. The screw passes through the mounting tab and into the skirt mounting hole in the enclosure. Tighten the screw to secure the assembly in the enclosure.
3. Connect earth ground to the panel before making any other connections. See section *3.5 Connecting Earth Ground.*

3.5 Connecting Earth Ground

3.5.1 Terminal 10

To help prevent damage from electrostatic charges or other transient electrical surges, connect the system to earth ground at Terminal 10 before making any other connections. A grounding rod or cold water pipe are recommended earth ground references.

Do not use telephone or electrical ground for the earth ground connection. Use 14-16 AWG wire when making the connection. Do not connect any other panel terminals to earth ground.

3.5.2 Ground Fault Detect Enable

IMPORTANT

Ground fault detect capability is available only on firmware versions 6.10 or higher.

GROUND FAULT is defined as “a circuit impedance to Earth Ground of approximately 95 kilohms or less.” The panel will detect a ground fault on Terminals 1-9 and Terminals 11-32 if the Ground Fault Detect Enable jumper (S4) (see *Figure 3*) is locked (closed) and a non-zero value is entered in Area 5 Silent Alarm Relay (see the *D9412G/D7412G Program Entry Guide*). When the jumper is in the unlocked (open) position, the panel will not detect ground fault conditions. If a ground fault condition occurs, the command centers will display `SERVC GND FAULT` and the panel will transmit a `TROUBLE REPORT GROUND FAULT AREA` (Modem IIIa^2 format only). In order for the panel to detect a ground fault condition, the panel must see the ground fault for at least 30 consecutive seconds. When the panel recognizes that ground fault condition is corrected, a `RESTORAL` report is sent. For the restoral condition to be met, the ground fault must have been corrected for between 5 and 45 consecutive seconds.

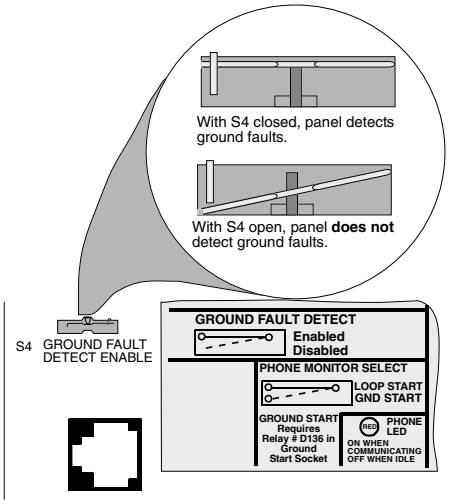

Figure 3: Ground Fault Detect

IMPORTANT

The 9000 Series Control/Communicators log and print a Ground Fault event as a Trouble Point 256.

3.5.3 Locking the Reset Pin

Locking the Reset Pin disables the panel. See *Figure 4*. The system ignores the command centers and points while disabled. `CALL FOR SERVICE` appears in command center displays while the pin is locked down.

On-board relays (Terminals 6, 7, and 8) and off-board relays deactivate when the panel is reset. There is power at Terminal 8 when the relay is deactivated. Activation interrupts power at that terminal. The relays remain deactivated while the Reset Pin is locked in the disable position.

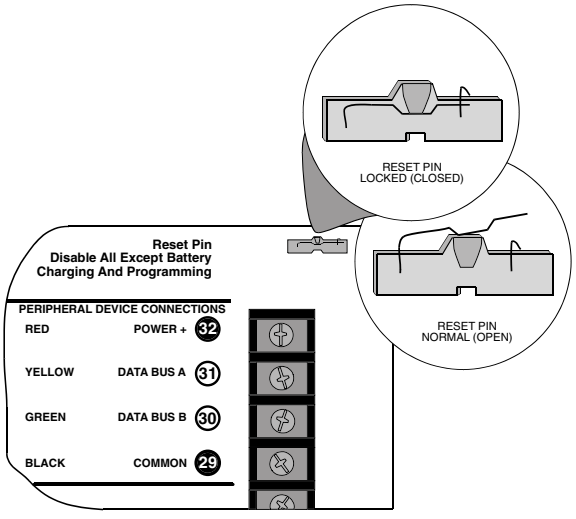

Figure 4: Reset Pin

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Releasing the reset pin from the closed position resets the panel. The panel resets all its timers, counters, indexes, and buffers. Any points that restore after a reset is performed will not generate restoral reports.

If the reset pin is placed in the disable position when all areas are armed, there must be an entry in the ***Answer Armed*** program item. See *RAM Parameters* in the *D9412G/D7412G Program Entry Guide*.

Locking the pin in the disable position allows powering up the panel and charging the battery while the detection devices and command centers are being installed.

3.6 Finishing the Installation

Earth ground and reset pin first: Make the earth ground connection to Terminal 10 and lock the reset pin in the closed position if not already done.

3.6.1 Charge the Battery While Finishing

Connect the battery and then the transformer so that the panel can charge the battery while the installation is being finished. See section *4.0 Power Supply* section for instructions.

On-board Buzzer Sounds at Power Up and Reset: The system performs a series of self diagnostic tests of its hardware, software, and program at power up and at reset. The buzzer on the panel sounds during the tests. The self diagnostics take about 1-3 seconds to complete.

If the panel fails any of the tests, the buzzer continues sounding and a system trouble message appears at the command centers. See *Problems Found During Self Diagnostics* in the *D9412G/D7412G Installation and Troubleshooting Quick Reference Guide* for a description of each system trouble message.

Touch Terminal 10 first: If the on-board buzzer sounds briefly when the panel is touched, any static charge that may be carried is being discharged to the panel. The panel may generate `WATCHDOG RESET` and/or `PARAM FAIL` events. See section *Watchdog Reset Reports* in the *D9412G/D7412G Installation and Troubleshooting Quick Reference Guide* for a description of these events. Always touch Terminal 10, the panel's earth ground connection, before beginning work on the panel.

3.6.2 Install and Wire Detection Devices

Install and wire detection devices and command centers at their locations throughout the premises. DO NOT make the connections at the panel end of the wiring yet.

Section *7.0 On-board Points* contains instructions for wiring the on-board points to detection devices. Section *10.0 Arming Devices* contains instructions for wiring the command centers.

Instructions for wiring the off-board point POPIT sensor loops are found in the instructions packaged with the POPIT Modules.

3.6.3 Install Modules and Relays

1. ***Power Down First:*** Power down the unit by unplugging the transformer and disconnecting the battery. Radionics recommends powering down the unit when installing modules or relays, or when making wiring connections to the panel.
2. Install and wire any modules required for the installation as described in the module's installation instructions.

   Instructions for the D8125 POPEX Module, the D8128D OctoPOPIT Module, the D8129 OctoRelay Module, the D811 Arm Status Relay Module, and the D928 Dual Phone Line Switcher appear in this manual.

   See section *8.0 Off-board Points* for D8125 and D8128D instructions. See section *9.0 Off-board Relays* for D8129 and D811 instructions. See section *6.12 D928 Dual Phone Line Switcher* for instructions for the D928.
3. If using the power outputs at Terminals 7 or 8, install a D136 relay in the appropriate sockets. See section *5.4 Programmable Power Outputs Terminals* for instructions.
4. If using a ground start phone system, insert a D136 relay in the ground start check socket and set the ground start pin in the ground start position. See section *6.11 Ground Start* for more information.

3.6.4 Make the Telephone Connections

See section *6.0 Telephone Connections*. If connecting the panel to a ground start phone system, install a D136 relay (section *3.6.3 Install Modules and Relays*).

3.6.5 Connect the On-board Points and Command Centers

Connect the on-board points and command center wiring to the system. See section *7.0 On-board Points* and section *10.0 Arming Devices* sections for instructions.

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3.6.6 Power Up

Reconnect the battery and then plug in the transformer. Remember the buzzer sounds for two seconds when the panel is first powered up.

Leave the reset pin locked down for now.

Yellow Charging Status LED doesn't go out: If the yellow charging status LED doesn't go out within five minutes of powering up the panel, the battery may be deeply discharged, or too many powered devices have been connected to the panel. Combined continuous current draw for Terminals 3, 8, 24, and 32, and the Accessory Connector cannot exceed 1.4 amp. See section *5.0 Power Outputs* for help.

3.7 Programming the Panel

If a program hasn't been created for the panel, review the *D9412G/D7412G Program Entry Guide*. Check to be certain all the required accessory modules to be installed for desired features are available. The reset pin must be in the locked position to copy or send information to and from the panel.

Use the D5200 Programmer or the Remote Account Manager (RAM IV) to load a custom program into the panel.

Move the reset pin to the normal position. See *Figure 3*. The panel transmits reboot and battery reports to the receiver if programmed for reporting.

3.8 Install the Point Chart Label

Radionics recommends the *Point Chart Label* provided in the literature pack be filled out and installed on the inside of the enclosure door for all systems.

Point chart label required for fire systems with verification points: The point chart label must be installed for fire or combined fire/burglary systems using verification points.

Use the *D9412G/D7412G Program Record Sheet* to gather the information needed to fill out the point chart. Install the label on the enclosure door as shown in *Figure 2*. To avoid smearing the entries on the chart, use the label's peel off backing to press the label in place.

3.9 Testing the System

After finishing the installation and programming of the panel, make a complete functional test of the system. Test the panel and all devices for proper operation. Test after first programming the panel and after any subsequent programming session.

Service Walk Test shows extra points: Use the service walk test at a panel wide command center to perform a complete test of the panel. The service walk test function is similar to the ordinary walk test function, with the additional ability to display points that are not properly programmed.

During a Service Walk Test, a tested POPIT with its switches set for a point with a blank point index and/or no area assignment, appears as an extra point.

If a device is tested and the panel doesn't respond, there may be a problem with the device, the wiring, the POPIT ID setting, or the programming for the point. If the switches on a POPIT are set incorrectly, it may create both a missing and extra point. When a missing point is found, performing a service walk test for extra points may help diagnose the problem.

See the *D9412G/D7412G Installation and Troubleshooting Quick Reference Guide* for complete service walk test instructions.

Clear after test: To clear the event memory and report buffer, momentarily close the reset pin. Events stored in the panel's event log are not cleared.

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4.0 Power Supply

4.1 Primary Power Terminals 1 2

4.1.1 Primary (AC) Power Circuit

A 16.5 VAC, 40 VA internally fused transformer (Radionics model D1640) is the primary power source. The AC power circuit provides 1.9 amps of rectified AC power. The panel reserves 500 mA of this power for internal operations leaving 1.4 amps for powered devices.

Transient suppressors and spark gaps protect the circuit from power surges. This protection relies on the ground connection at Terminal 10. Make sure to connect Terminal 10 to a proper ground. See section *3.5 Connecting Earth Ground.*

AC Power Failure

The system indicates an AC power failure when the power at Terminals 1 and 2 is missing. The ***AC Fail Time*** program item sets the number of minutes or seconds that AC must be missing before the panel acknowledges the failure and the number of minutes or seconds after the power returns before the panel acknowledges the restoral of power. See the *D9412G/D7412G Program Entry Guide* for additional information regarding *AC Fail Time.*

4.1.2 Installing the Transformer

Do not short the terminals of the transformer: Shorting the terminals opens the internal fuse causing permanent failure. Connect the transformer to Terminals 1 and 2 of the panel before plugging it into the power source.

Use 18 AWG (minimum) wire to connect the transformer to the panel. Wire length should be kept as short as possible. Maximum length is 50 ft. (15 m).

AC wiring can induce both noise and low level voltage into adjacent wiring. Route phone and sensor loop wiring away from any AC conductors, including the transformer wire. Route data wiring away from AC and phone wiring.

Connect the battery and then plug in the transformer: Radionics recommends that the battery always be connected first and then the transformer be plugged in. See section *4.2.2 Installing the Battery*.

Only plug the transformer into an unswitched, 120 VAC, 60 Hz power outlet. Secure the transformer to the outlet with the screw provided.

D8004 Transformer Enclosure required for fire systems: Use the D8004 Transformer Enclosure for the D1640 transformer in fire and combined fire/burglary applications. Check with the Authority Having Jurisdiction (AHJ) on mounting transformers on specific circuits.

4.2 Secondary Power Terminals 4 5

4.2.1 Secondary (DC) Power

A 12 V, 7 Ah (up to 14 Ah) sealed lead-acid rechargeable battery (D126) supplies secondary power for auxiliary and alarm outputs, and powers the system during interruptions in primary (AC) power.

Lead Acid Batteries ONLY: The charging circuit is calibrated for lead-acid batteries. Do not use gel-cell or nicad batteries.

Extra Batteries Increase Back-up Time: To increase battery back-up time, connect a second 12 V, 7 Ah battery in parallel to the first battery to form a 12 V, 14 Ah battery. Use a D122 Dual Battery Harness to ensure proper and safe connection.

D1218 Battery

The D1218 is a 12 V, 17.2 or 18 Ah battery and can be used in applications requiring extended battery standby time. Up to two D1218 batteries may be connected when used with a D122 Dual Battery Harness. Do not use any additional batteries when using a D1218 battery.

4.2.2 Installing the Battery

Place the battery upright in the base of the enclosure. Locate the red and black leads supplied in the literature pack. Connect the black battery lead to Terminal 4, and then to the negative (-) side of the battery. Connect the red

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battery lead to Terminal 5, and then to the positive (+) side of the battery.

WARNING

High Current Arcs Possible

The positive (red) battery lead and Terminal 5 can create high current arcs if shorted to other terminals or the enclosure. Use caution when working with the positive lead and Terminal 5. Always disconnect the positive (red) lead from the battery before removing it from Terminal 5.

CAUTION

The Battery Terminals and Wires are NOT Power Limited. *A ¼ in. (6.4 mm) spacing must be maintained between the battery terminals, battery wiring and all other wiring. Battery wiring may not share the same conduit, conduit fittings or conduit knock-outs with other wiring. See Figure 5.*

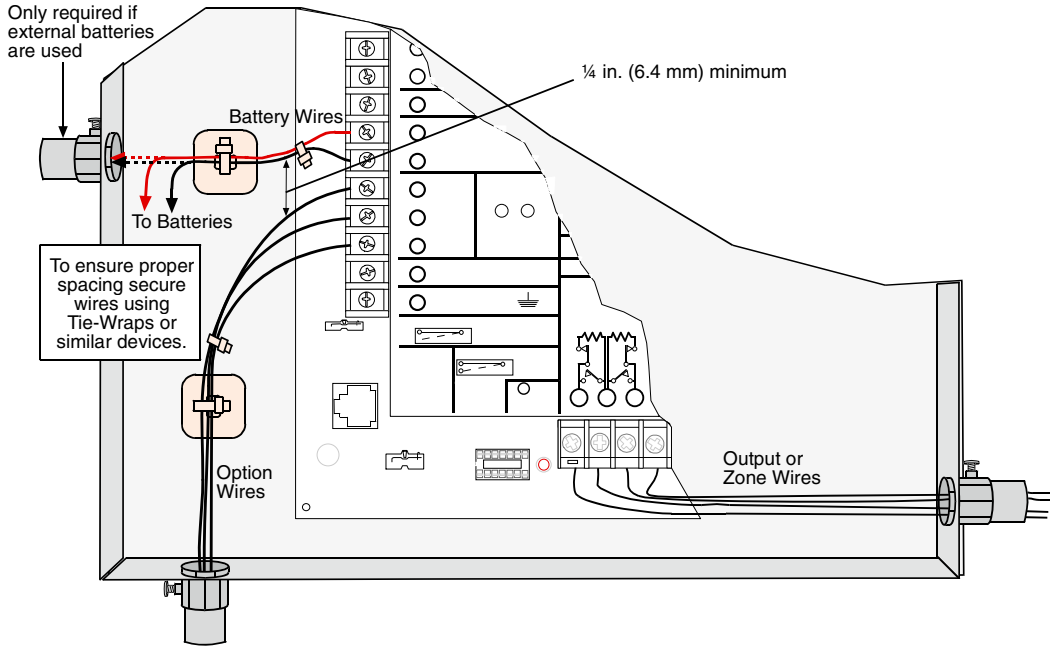
Only required if external batteries are used
¼ in. (6.4 mm) minimum
Battery Wires
To Batteries
To ensure proper spacing secure wires using Tie-Wraps or similar devices.
Option Wires
Output or Zone Wires

Figure 5: Non Power Limited Wiring

4.2.3 Replacing the Battery

Radionics recommends battery replacement every 3 to 5 years under normal use. Exceeding the maximum output ratings, or installing the transformer in an outlet that is routinely switched off, causes heavy discharges. Routine heavy discharges can lead to premature battery failure. Record the date of installation directly on the battery.

D8132 boosts battery backup: Adding a D8132 Battery Charger Module supports additional batteries of up to 36 Ah capacity if required.

The D8132 Battery Charger Module can be used to connect two additional batteries for a total of four. The panel plus any connected D8132 Modules and AUX power supplies must be on the same AC circuit so they will discharge evenly if AC power fails. The number of D8132 Modules is determined by the number of available outlets on the same circuit. See *Standby Battery and Current Rating Chart* in the *D9412G/D7412G Approved Applications Compliance Guide* for battery standby time calculations.

Note: ***In applications where the supervision of two batteries is required by the AHJ, a D113 Battery Supervision Module must be used.***

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4.2.4 Battery Supervision

When the battery voltage drops to 13.8 VDC, the yellow Charging Status LED lights. When the battery drops to 12.1 VDC the red Low Battery LED lights and the panel, if programmed for power supervision, transmits a `BATTERY LOW` report in the Radionics' Modem IIIa² Communication Format. It transmits a `TROUBLE ZN 9` report in the BFSK format.

If the battery is missing or shorted, the red Low Battery LED flashes at the same rate as the green Operation Monitor LED. If the panel is programmed for power supervision, it transmits a `BATTERY MISSING` report in the Radionics' Modem IIIa² Communication Format, or `TROUBLE ZN 9` report in the BFSK format.

When battery voltage returns to 13.7 VDC the Low Battery LED goes out. If the panel is programmed for power supervision, it transmits a `BATTERY RESTORAL` report in the Radionics' Modem IIIa² Communication Format or `RESTORAL ZN 9` report in the BFSK format. At 13.9 VDC the Charging Status LED goes out.

Investigate low battery reports immediately: If primary (AC) power is off and the discharge continues, the panel becomes inoperative when the battery voltage drops below 10.2 VDC.

4.2.5 Battery Charging Circuit

Float Charge

The float voltage for the battery charging circuit is 13.5 to 13.9 VDC at a maximum current of 1.4 amps. If float voltage drops lower than 13.5 VDC, the Charging Status LED will illuminate.

Loss of AC Load Shed Relay protects battery: During an AC power loss the battery supplies all power to the security system. If the battery voltage falls below 10.2 volts during an AC power loss, a "load shed" relay isolates the battery from the panel and disables the panel. Load shed protects the battery from being damaged by deep discharge. When AC power restores, the load shed relay resets and battery voltage is again available.

Overcharge Load Shed With AC Present: If more than 1.4 amps of current draw from the panel is detected, the panel shuts down. Remove all loads to the panel and disconnect AC power. Add a new battery and reconnect AC power.

Reset the panel by momentarily placing the reset pin in the disable position. See *Figure 4*. The red Low Battery LED continues to flash until the panel is reset.

A shorted battery condition is created either by a shorted cell inside the battery or by a short on Terminals 4 and 5. A shorted battery may generate `WATCHDOG RESET` reports.

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4.2.6 Battery Discharge/Recharge Schedule

Discharge Cycle

AC OFF	AC fail report when AC fails if panel is programmed to report AC failure at occurrence.
13.9 VDC	Charging float level
13.8 VDC	Charging Status LED on
12.1 VDC	Low Battery & AC fail reports if programmed; Low Battery LED on
10.2 VDC	Battery load shed (processing functions continue if AC is present)

Recharge Cycle

AC ON	Load shed relay resets, battery charging begins, battery trouble and AC restoral reports sent.
13.7 VDC	Battery restoral reports sent, Low Battery LED off
13.9 VDC	Charging Status LED off, battery float charged

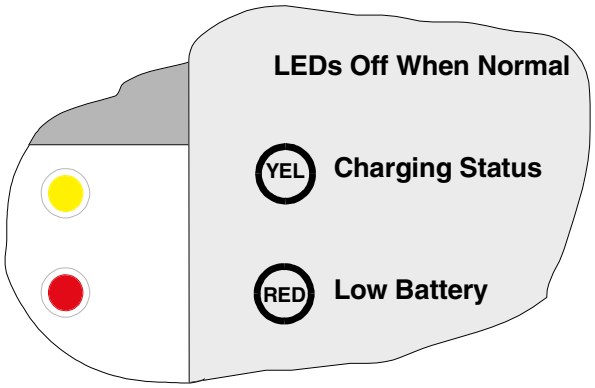

Figure 6: Charging and Battery LEDs

4.3 Charging Status and Low Battery LEDs

Type	LED Color	LED State	Action
Charging Status LED	Yellow		Shows the charging status of the battery. *Figure 6* shows its location.
	Yellow	Off	Battery is fully charged. ***If the battery is missing, shorted, or reversed:*** *The Charging Status LED is off, but the red Low Battery LED is flashing.*
	Yellow	On	Battery float charge is below 13.8 VDC. If AC is present the battery is charging. When the combined current draw from all outputs exceeds 1.4 amps. This is normal under alarm conditions for non-fire systems with sirens or bells draw more than 1.4 amps. If the LED comes on regularly for extended periods or doesn't go out, check the current draw for devices connected to the power outputs. See section 5.0 *Power Outputs* for instructions.
	Yellow	Flash once/min	System is checking the battery.
	Yellow and Red	Flash once/min	When the current draw for devices connected to the power outputs exceeds 1.4 amps and/or the battery is missing.
Low Battery LED	Red		Shows the condition of the battery. *Figure 6* shows its location.
	Red	Off	When the battery is fully charged.
	Red	On	Battery voltage as fallen below 12.1 VDC. LED goes out when voltage reaches 13.7 VDC.
	Red	Flash (same rate as Green LED)	Green LED is Operation Monitor LED. Battery is missing or shorted.
	Red and Yellow	Flash once/min	When current draw for devices connected to the power outputs exceeds 1.4 amps and/or the battery is missing.

Table 7: Charging Status and Low Battery LEDs

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5.0 Power Outputs

5.1 Circuit Protection

Three Positive Temperature Coefficients (PTCs) protect the panel from short circuits on both the continuous and programmable power outputs. If the panel is programmed for power supervision and short is sustained on one of the power outputs, the panel transmits a `BATTERY LOW` or `BATTERY MISSING` for Radionics' Modem IIIa^2 Communication Format, or `TROUBLE ZN 9` for BFSK.

One PTC protects Terminal 3: Auxiliary Power and Terminal 24: ZONEX Power. A short on one disrupts the power to the others.

One PTC protects Terminal 6: Alarm Power Output, Terminal 7: Alternate Alarm Power Output, and Terminal 8: Switched Auxiliary Power. A short on one of these terminals disrupts the power to the other two.

One PTC protects Terminal 32: Power +.

5.2 Total Available Power

The system produces up to 1.4 amp of combined power at 10.2 VDC to 13.9 VDC for all powered devices. The outputs listed below share the available power. These outputs are shown as red circles on the face plate.

Terminal 3 - Auxiliary Power. Use this terminal to power devices requiring continuous power.

Terminal 6 (Relay A) - Alarm Power Output. Normally open, power on alarm.

Terminal 7 (Relay B) - **Alternate Alarm Power Output.** Normally open, power on alarm.

Terminal 8 (Relay C) - Switched Auxiliary Power. Normally open, power off on reset.

Terminal 24 - ZONEX Power. Use this terminal to power ZONEX Modules such as the D8125, D8128D, and D8129 Modules.

Terminal 32 - Power +
Use this terminal to power SDI (Serial Device Interface) devices such as command centers, the D9131A Parallel Printer Interface Module, and the D9210B Wiegand™ Control Interface Module.

Accessory Connector
The D928 Dual Phone Line Switcher connects to the accessory connector.

5.3 Continuous Power Outputs Terminals (3)(24)(32)

5.3.1 Continuous Current Draw

The **continuous** current draw for powered devices connected to Terminals 3, 8, 24, and 32 and the Accessory Connector must not exceed 1.4 A. Devices powered from these outputs must operate over a range of 10.2 VDC to 13.9 VDC.

Power restricted for fire and combined fire/burglary systems: Use the *Fire System Power Formula* to calculate the current available for fire and combined fire/burglary systems (see section *5.4 Programmable Power Outputs Terminals*).

5.4 Programmable Power Outputs Terminals (6)(7)(8)

5.4.1 Programming

The power outputs at Terminals 6, 7, and 8 are programmed as Relays A, B, and C. All relays are programmed in the *Relays* section of the program. Relays are assigned a relay type, Fire Bell for example, when they are assigned to an area. Relays can be assigned to one or more areas.

The Radionics defaults set Relay A (Terminal 6) as a Steady Alarm Bell output and Relay B (Terminal 7) as a Pulsed Fire Bell output, and Relay C (Terminal 8) as a Verification/Reset output for smoke detectors. The *D9412G/D7412G Program Entry Guide* contains complete instructions for programming relays. Descriptions of the functional characteristics of each terminal appear on the next page.

See the *Bell Parameters* section of the program to set the Fire Bell, Alarm Bell output responses for relays. Four annunciation patterns: Steady, Pulsed, California Standard, and Temporal Code 3 are available.

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Power Outputs

Voltage Output at Terminals 6, 7 and 8: If Terminals 6, 7, and 8 don't provide the expected output:

- Check the programming for Relays A, B, and C in the *Relays* section of the program.
- Check the *Bell Parameters* section of the program to verify the Alarm and Fire Bell responses are programmed for the expected duration and pattern.
- Check the *Point Assignments* to verify each point is programmed for the expected local response.

5.4.2 Optional Relays Required

Install an optional D136 Plug-in Relay into the ALT ALARM socket to enable the output at Terminal 7. Install a D136 in the SW AUX socket to enable the output at Terminal 8. The relay sockets are under the faceplate as shown in *Figure 7*.

Relay Installation

Power down the system before inserting the D136 relays. The plug-in relays are shorter than the sockets they plug into. See *Figure 7*. They can be installed in either the left or right end of the socket.

Don't rely on relay labelling:
Don't rely on the labelling to install D136 relays. Check for the side with three pins. The three pins go on the top side of the socket.

Incorrect insertion does not damage the relay or the system, however the related circuits do not function properly.

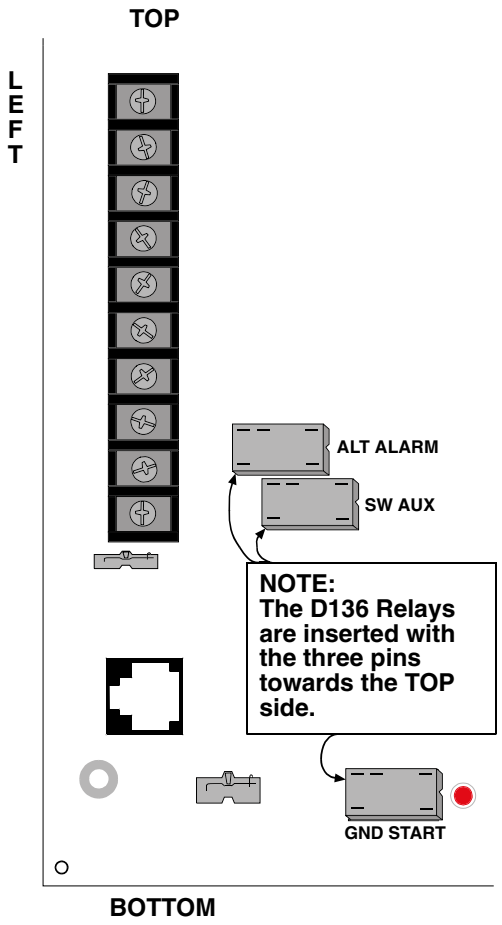

Figure 7: Relays for Terminals 7 and 8 and Ground Start

5.4.3 Terminals 6 and 7

Terminals 6 (Relay A) and 7 (Relay B), provide positive (+) 10.2 VDC to 13.9 VDC power output when activated. Use the power at Terminals 6 and 7 to power bells, siren drivers, piezo fire sounders, electronic horns, or other devices. Programming determines the format of the output and the conditions that activate it. One PTC protects Terminals 6, 7, and 8 against shorts.

Available Power

The system combines the 1.4 amp of primary power produced by the power supply with the secondary power source (the battery) to produce a total of 2.0 amp of **alarm** power at 10.2 to 13.9 VDC. Terminals 6 and 7 share the available alarm power.

Power restricted for fire and combined fire/burglary systems: Fire systems are prohibited from using the battery for determining alarm power. Use the *Fire System Power Formula* below to calculate the current available for fire and combined fire/burglary systems.

5.4.4 Fire System Power Formula

To calculate the current available at Terminals 6 and 7 for fire and combined fire/burglary systems:

1. Add together the current draws for all devices connected to Terminals 3, 8, 24, and 32, and the Accessory Connector. This total is the total current required for the **N**ormal **S**tandby **C**ondition (NSC).
2. The current available for NSC is 1.4 A. Subtract the NSC current required calculated in step 1 from the NSC current available, 1.4 A. The difference is the Alarm Current available for Terminals 6 and 7.

In formula format:
1.4 A – NSC current required (step 1) = Alarm Current available

Refer to the *D9412G/D7412G Approved Applications Compliance Guide* for module/accessory current requirements.

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5.4.5 Terminal 8

Terminal 8 provides continuous positive (+) 10.2 VDC to 13.9 VDC power. Relay C interrupts the power at Terminal 8 when activated. Use Terminal 8 to power smoke detectors or other devices that are reset by interrupting power. One self-resetting circuit breaker protects Terminals 6, 7, and 8 against shorts.

Verification/Reset Relay

The default program sets Relay C (Terminal 8) as a verification/reset relay. See *Relay Parameters* and *Point Assignments* in the *D9412G/D7412G Program Entry Guide* for instructions on programming verification/reset relays and points.

Performing a Sensor Reset at a command center produces a five second relay activation of verification/reset relays. The panel ignores verification/reset points during the five seconds of relay activation.

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Power Outputs

Notes:

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6.0 Telephone Connections

6.1 Registration

The Radionics D9412G/D7412G Control/Communicator panels are registered with the Federal Communication Commission under part 68, for connection to the public telephone system using an RJ31X or RJ38X jack installed by the local phone company.

Note: ***An RJ31X jack can be modified by placing a jumper wire between Terminals 2 and 7 to become an RJ38X jack.***

6.2 Notification

Do not connect registered equipment to party lines or coin-operated telephones. The local telephone company must be notified and supplied with the following information before connecting the panel to the telephone network:

- The particular line to which the panel will be connected
- Make (Radionics), model (D9412G or D7412G), and serial number of the panel
- FCC registration number and ringer equivalence for the panel:

  FCC Registration Number: AJ9MUL-46532-AL-E

  Ringer Equivalence: 0.1B

6.3 Location

To prevent jamming of signals, wire the RJ31X or RJ38X jack before the in-house phone system to support line seizure. See *Figure 8*. Install the jack on the street side of the phone switch, wired ahead of any PBX equipment. Line seizure provides for a temporary interruption of normal phone usage while the communicator transmits data. After installation, confirm that the panel seizes the line, acquires dial tone, reports correctly to the receiver, and releases the phone line to the in-house phone system.

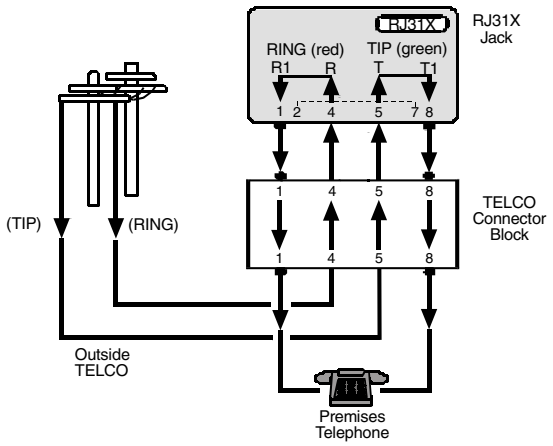

Figure 8: RJ31X Wiring

6.4 Phone Cord Connection

Connect one end of a D161 (7 ft. [2.1 m]) or D162 (2 ft. [61 cm]) Telephone Cord to the TELCO Cord connector located on the bottom left corner of the panel. See *Figure 9*. Connect the other end to the RJ31X or RJ38X jack.

Note: ***To supervise the phone cord, use an RJ38X jack.***

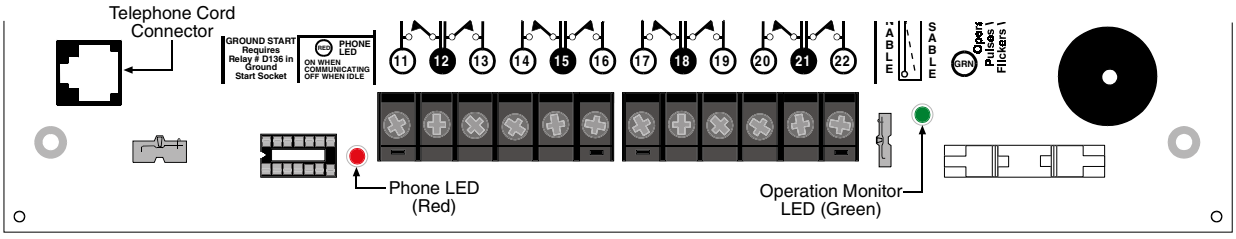
Telephone Cord Connector
GROUND START Requires Relay # D136 in Ground Start Socket
PHONE LED
ON WHEN COMMUNICATING
OFF WHEN IDLE
11 12 13 14 15 16 17 18 19 20 21 22
Phone LED (Red)
Operation Monitor LED (Green)

Figure 9: Phone Connector and LED and Operation Monitor LED Locations

6.5 Phone LED (Red)

The red Phone LED lights when the panel seizes the phone line and remains lit until the panel returns the phone line. See *Figure 9* for the location of the red LED.

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6.6 Operation Monitor LED (Green)

The green Operation Monitor LED indicates the operation of the CPU (**C**entral **P**rocessing **U**nit). When the CPU is operating normally, the LED flashes 0.5 second on, 0.5 second off.

The green LED also serves as a ring indicator. The LED is located on the lower right side (see *Figure 9*). When there is ring voltage on the phone line (the phone is ringing), the green LED flickers at a faster rate for the duration of each ring. Ring voltage must reach a minimum of 45 VAC before the system detects it.

6.7 Dialing Format

The system can be programmed to use DTMF or pulse dialing. See *Phone Parameters* in the *D9412G/D7412G Program Entry Guide*.

6.8 Phone Line Monitor

The panel has a built-in phone line monitor that tests the phone line for voltage. If the D928 Dual Phone Line Switcher is used to connect two phone lines to the panel, the panel monitors both lines. The normal voltage on a telephone line is approximately 48 VDC (24 VDC for some phone systems). The phone line monitor senses trouble when the voltage on the line falls below 3.0 VDC.

If the monitor senses trouble, it starts a programmable phone line trouble timer. The timer continues to run as long as the monitor senses trouble. It resets to zero when the panel senses a normal line. If the timer reaches the delay time in the *Phone Supervision* program item, it begins a phone line trouble response. Programming determines what the response is. See *Phone Parameters* in the *D9412G/D7412G Program Entry Guide.*

The panel stops monitoring the phone line during its phone line trouble response. If the response includes sending a report, the panel does not resume monitoring until the report is acknowledged or it goes into communication failure.

Bad line may test OK: The telephone line monitor uses voltage levels to test the status of the phone line. In some instances a given telephone line may be out of service without affecting the voltage on the line. The phone line monitor can not recognize this trouble condition.

6.9 Called Party Disconnect

Telephone companies provide “called party disconnect” to allow the called party to terminate a call. The called party must go on hook (hang up) for a fixed interval before a dial tone is available for a new call. This interval varies with telephone company equipment. D9412G/D7412G firmware allows for “called party disconnect” by adding a 35 second “on hook” interval to the dial tone detect function. If the panel does not detect a dial tone in seven seconds, it puts the phone line on hook for 35 seconds to activate “called party disconnect,” goes off hook and begins a seven-second dial tone detect. If no dial tone is detected, the panel dials the number anyway. Each time the number is dialed, the panel records this as an attempt.

6.10 Communication Failure

After two attempts to reach the receiver, a `COMM FAIL PH #` event is generated. This event will tag along with the original event.

After ten attempts to reach the receiver, the panel goes into communication failure. The panel clears any reports in its phone buffer and `COMM FAIL RT #` event is generated, which appears in the display at command centers. A trouble sounder can be programmed to annunciate at the command centers. An hour after the `COMM FAIL RT #` is generated, the panel attempts to send this event, if programmed. If the `COMM FAIL RT #` event is the only event in the queue and is unable to reach the central station, the command centers will not turn on the trouble sounder again.

If the D928 Dual Phone Line Switcher is used, the D9412G/D7412G makes a total of ten attempts before going into communication failure.

6.10.1 Enhanced Communication

The D9412G/D7412G Control/Communicator panels have the ability to transmit events over the SDI Bus to a D9133TTL-E Network Interface Module. For more information on Enhanced Communications capabilities, please refer to *RADXAUX1* in the *D9412G/D7412G Program Entry Guide*.

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6.11 Ground Start

Some telephone systems require a momentary ground input to initiate dial tone. To interface with a ground start system, insert a D136 Plug-in Relay into the GND START socket and set the Phone Monitor Select jumper to the GND START position.

WARNING

Ground start not for use in NFPA applications. *You cannot use ground start telephone systems for NFPA Central Station Protective Signaling or Remote Station applications.*

Note: *Terminal 10 must be connected to an earth ground in order for ground start phone systems to operate properly on the D9412G/D7412G.*

6.11.1 Relay Installation

Power down the system before inserting the D136 relay into the GND START socket. The relay socket is in the lower left corner as shown in *Figure 7*. The plug-in relay is shorter than the socket it plugs into. It can be installed in either the left or right end of the socket.

Don't rely on relay labeling: Don't rely on the labelling to install D136 relays. Check for the side with three pins. The three pins go on the top side on the socket.

Incorrect insertion does not damage the relay or the panel, however the related circuits do not function properly. A ground start relay must not be inserted if the ground start jumper is in the loop start position (see below).

6.11.2 Phone Monitor Select Jumper

The Phone Monitor Select jumper is above the TELCO connector point at the lower left corner of the panel. Set it in the ground start position. See *Figure 10*.

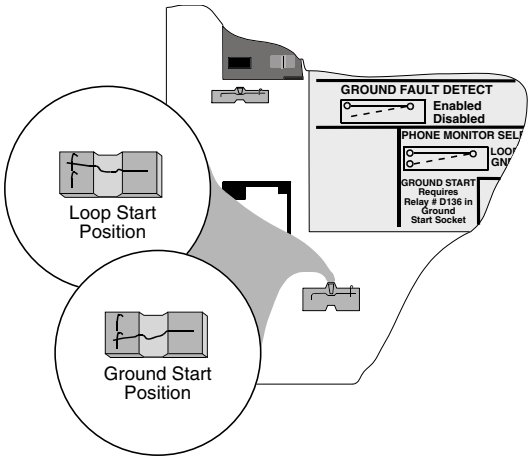

Figure 10: Phone Monitor Select

6.12 D928 Dual Phone Line Switcher

6.12.1 Description

The optional D928 Dual Phone Line Switcher allows the panel to transmit reports over two separate phone lines. The panel monitors both lines. If a signal is generated and the panel senses that a line is bad, then it will attempt to use the other phone line to send the message. If trouble is detected, the panel keeps the faulty phone line in memory.

Set the ring count above 2 on answering machines: The panel's RAM Line Monitor feature may not operate correctly if an answering machine with a ring count of less than two rings is connected to a phone line used by the D928 Module.

6.12.2 Operation

See *Phone* in the *D9412G/D7412G Program Entry Guide* for phone supervision and reporting options. Set the *Two Phone Lines* prompt to YES to use the D928.

When the D928 is installed, the panel will alternate between Phone Line 1 and Phone Line 2 to send its first report. For example, on day one the panel will attempt to first communicate on Phone Line 1. On day two, the panel will switch and attempt to communicate on Phone Line 2.

Note 1: *Any time the panel is reset or powered down/up, the next reported event will always attempt to call out on Phone Line 1 first.*

Note 2: *If Phone Line 2 is not in service on "Day 2," the panel will switch to the Primary Phone Line to send the report.*

With the D928 Dual Phone Line Switcher installed, the panel uses two phone lines, primary and secondary, to dial up to four phone numbers.

When using a Primary and Backup Device within a Route Group #, the panel makes two attempts on the primary phone line using the Primary Device # as programmed. If these two attempts fail, the panel switches to the secondary phone line using the Backup Device # as programmed. This pattern continues for a total of ten attempts. After ten unsuccessful attempts, the panel generates a Comm Fail event for the given Route Group #.

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Telephone Connections

6.12.3 Watchdog Feature

The D928 Watchdog circuit monitors the panel's CPU (**C**entral **P**rocessing **U**nit) for proper operation. If the CPU fails, the buzzer on the D928 sounds as does the sounder on the panel. This sounder cannot be reset while the CPU is failed. The D928 stops sounding only when the panel's CPU returns to normal operation.

6.12.4 Installing the D928

Mounting

The D928 must mount on the lower right side of the enclosure using the screws provided with the switcher.

Wiring

The D928 has two flying leads. The green lead monitors AC power. The black lead provides surge protection for the two incoming phone lines. The black lead also is the ground reference for the AC LED.

1. Connect the green lead from the D928 to Terminal 1.
2. Connect the black lead from the D928 to Terminal 9.

Phone Connections

1. Plug one end of the ribbon cable provided with the D928 into J4 on the D928. Plug the other end into the ACCESSORY CONNECTOR on the panel.
2. Plug one end of the D162 (2 ft. [61 cm]) phone cord provided with the D928 into J3 on the D928. Plug the other end into TELCO on the panel.
3. Plug one end of a D161 (7 ft. [2.1 m]) or D162 (2 ft. [61 cm]) phone cord into J1 on the D928. Plug the other end into the RJ31X or RJ38X for the primary phone line.
4. Plug one end of a D161 or D162 phone cord into J2 on the D928. Plug the other end into the RJ31X or RJ38X for the secondary phone line.

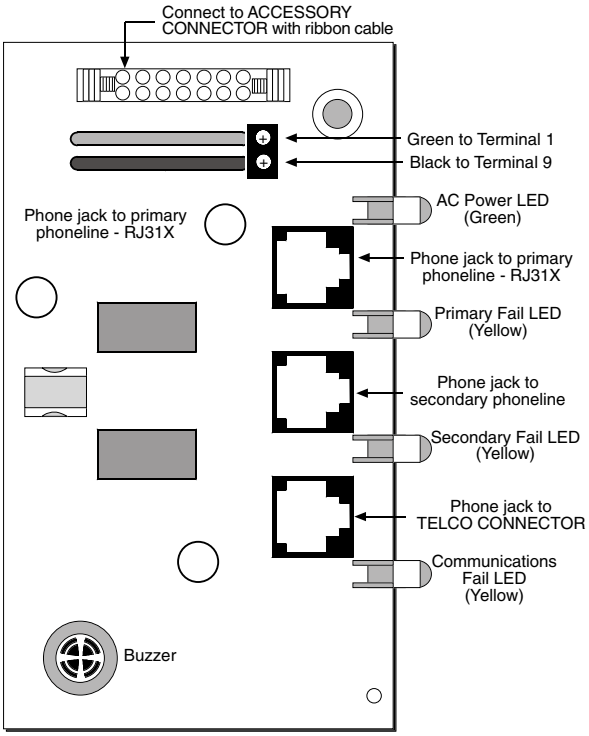
Connect to ACCESSORY CONNECTOR with ribbon cable
Green to Terminal 1
Black to Terminal 9
AC Power LED (Green)
Phone jack to primary phoneline - RJ31X
Phone jack to primary phoneline - RJ31X
Primary Fail LED (Yellow)
Phone jack to secondary phoneline
Secondary Fail LED (Yellow)
Phone jack to TELCO CONNECTOR
Communications Fail LED (Yellow)
Buzzer

Figure 11: D928 Dual Phone Line Switcher

6.12.5 D928 Status LEDs

Four LEDs mounted on the front edge of the D928 Module show the status of AC power for the panel, the status of the two phones lines, and communication failure. See *Figure 11*. When programmed and operating normally, only the green AC power status LED should be lit.

AC Power LED

The green AC Power Status LED lights when there is AC power at Terminals 1 and 2 on the panel.

IMPORTANT

An issue has been discovered on D928 modules purchased before November 19, 2001. If you have installed a D928 on a Radionics D9412G or D7412G you may test for the condition by disconnecting AC power from the panel (the battery must remain connected) and observing the green LED. If the green LED glows dimly, the module may be replaced at no charge.

Phone Line Fail LEDs

Two yellow Phone Line Status LEDs (one for the primary phone line, one for the secondary phone line) light up when phone line voltage drops below 3.0 VDC. The panel monitors the faulty phone line for the programmed interval before indicating a trouble condition. See section *6.8 Phone Line Monitor* for a description of phone line monitor operation.

Communication Failure LED

The yellow Communication Failure LED lights when the system is in communication failure. The LED is cleared when communication restores. See section *6.10 Communication Failure*.

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7.0 On-board Points

7.1 Description Terminals (11) to (22)

The panel provides eight on-board points. Each point functions independently and does not interfere with the operation of the others. The panel monitors the sensor loops for normal, shorted, or open conditions between an input terminal (11, 13, 14, 16, 17, 19, 20, or 22) and any of the point common terminals (12, 15, 18, and 21). Programming for the point determines how the panel responds to those conditions. See the *D9412G/D7412G Program Entry Guide* for point programming options. The panel also monitors the sensor loops for ground fault conditions if S4 is latched (ground fault detect enabled).

7.2 Point Sensor Loops

When wiring the on-board points (see *Figure 12*), install a 1 kΩ resistor at the far end of the sensor loop to provide a reference for supervision. Dry-contact sensing devices can be connected in series (normally-closed) and/or in parallel (normally-open) to any of these loops.

The number of normally-open and/or normally-closed detection devices each sensor loop can supervise is limited only by the resistance on the loop. The total resistance for wire length and contacts, minus the end-of-line resistor, must not exceed 100 ohms.

7.3 Point Parameters

The condition of on-board points 1 to 8 can be determined by measuring the voltage across the point input terminal and one of the common terminals. The sensor loops must be connected and the 1 kΩ end of line resistor in place.

Open Loop	=	Greater than 3.7 VDC, but less than 5.0 VDC.
Normal Loop	=	Greater than 2.0 VDC, but less than 3.0 VDC.
Shorted Loop	=	Greater than 0.0 VDC, but less than 1.3 VDC.

7.4 Point Response Time

The panel scans both on-board and off-board point sensor loops every 300 milliseconds. The *Debounce Count* program item in the *Point Assignment* section determines point response time by setting the number of scans that a point must be faulted before the panel initiates an alarm.

The debounce count can range from 2 to 15. Therefore point response time ranges from 600 milliseconds to 4.5 seconds. The Radionics default for Debounce Count is 2.

WARNING

Increasing debounce may cause missed alarms: *If you increase the Debounce Count, detection devices may go into alarm and reset without exceeding the point response time.*

Radionics recommends a debounce count of 2 for all points except for *Interior Follower* points, which should be programmed as a 3. In addition to this, door points that are connected to a D9210B Access Control Interface Module should be programmed with a debounce of 4.

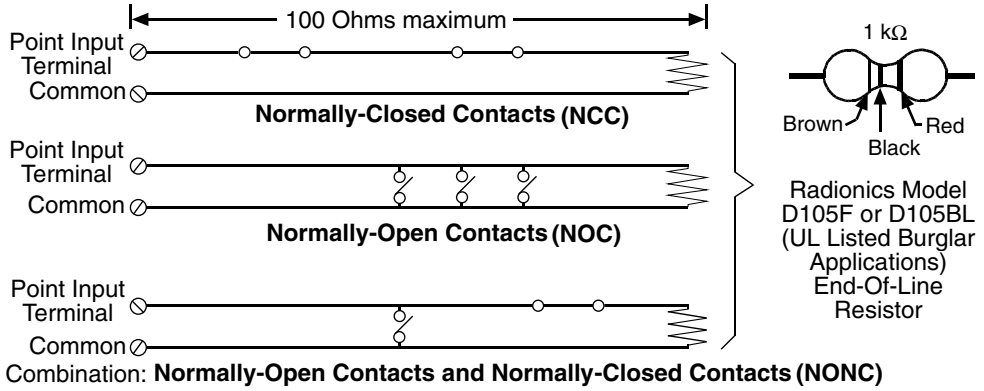

Figure 12: On-board Point Sensor Loop Wiring

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7.5 Wiring Information for Installations using the Ademco AB-12 Bell/Housing

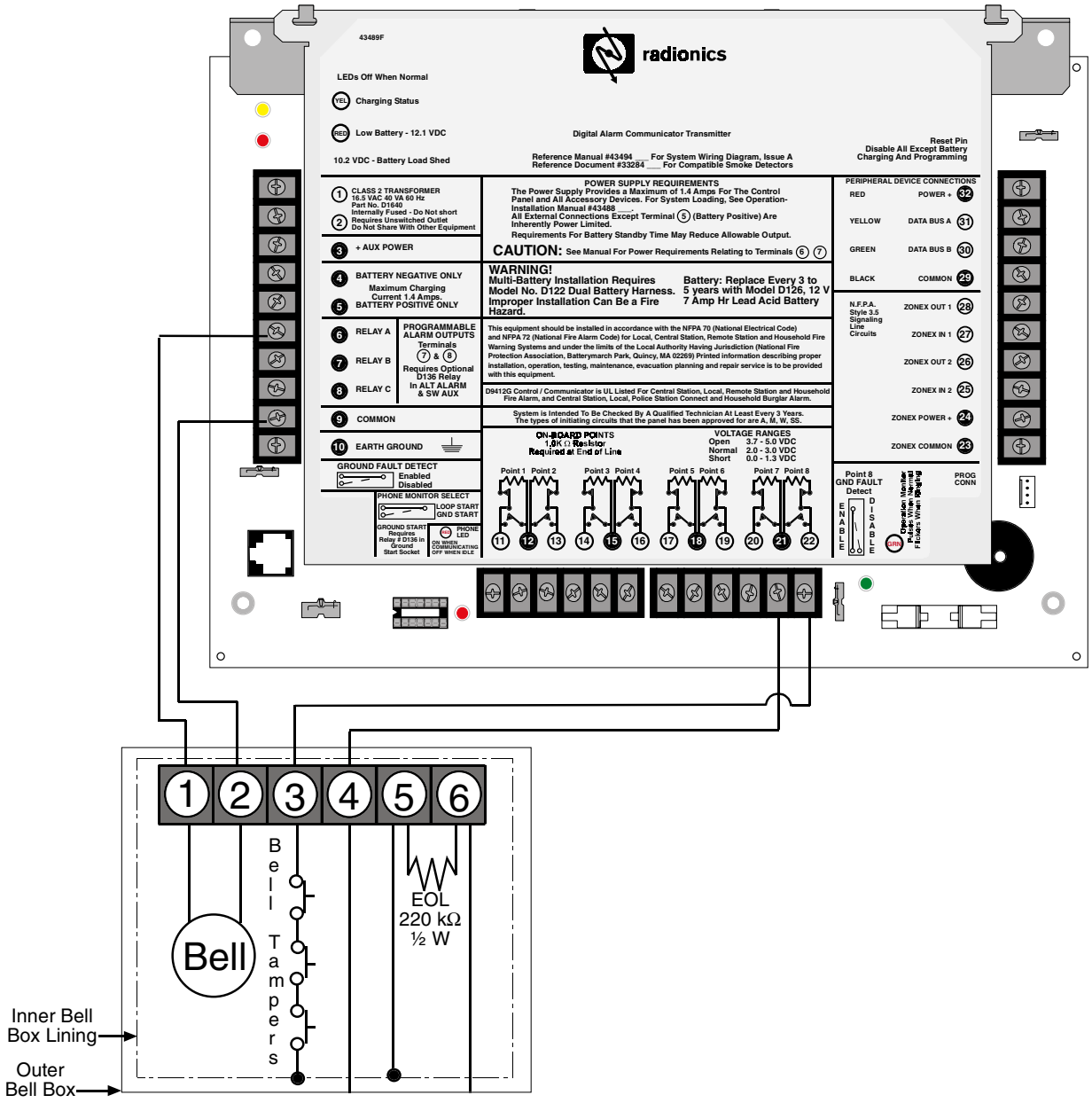

Figure 13: Wiring for Installations using the Ademco AB-12 Bell/Housing

1. Disconnect the wire jumper from Terminal 4 to the inner housing of the Bell Box (prevents a ground fault condition).
2. Connect wiring between the control and Bell Box as shown above. To use the AB-12 Bell/Housing, place the S3 switch in the disabled (open) position. The EOL used in the AB-12 Bell/Housing must be a 220 kΩ, 0.5 W resistor.
3. Program Point 8 as 24-hour, ALARM on open and short. (PT TYPE 0, PT RESPONSE 0).

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8.0 Off-board Points

8.1 Point (ZONEX) Bus D9412G Terminals 23 to 28 D7412G Terminals 27 to 28

The D9412G can use POPIT (**P**oint **o**f **P**rotection **I**nput **T**ransponder) Modules to provide up to 238 off-board points, bringing the total number of points the D9412G can monitor to 246. The D7412G can provide up to 67 off-board points bringing the total number of points the D7412G can monitor to 75. Each off-board point requires a POPIT Module.

POPITs connect to supervised two-wire data expansion loops run from POPIT to POPIT throughout the premises. Data expansion loops connect to a D8125 POPEX (**P**oint **o**f **P**rotection **Ex**pander) Module. POPEX Modules connect to the point bus on the panel, Terminals 23 and 24 for power (3 and 9 on the D7412G), and Terminals 25 and 26 (D9412G only), or 27 and 28 for data.

If a POPIT is disconnected from the expansion loop, a trouble message (Extra Point) appears immediately. See the *D9412G/D7412G Program Entry Guide* for programming options.

If a POPIT is connected to the expansion loop that is programmed for a point number that does not appear in the program for the panel, it appears as a trouble condition when the data expansion loop *restores* from a faulted condition. A faulted condition on the data expansion loop includes:

1) Positive leg of the data expansion loop shorted to ground.
2) Negative leg of the data expansion loop shorted to ground. If Ground Fault Detect is enabled, this causes a general Ground Fault event.
3) Data expansion loop (positive or negative leg) becomes disconnected.
4) Data expansion loop becomes shorted.

Placing a short on the data expansion loop generates a `PT BUS TROUBLE` report. The panel sees all points on the shorted expansion loop as shorted, and responds according to point programming, except for fire points. The fire points will respond locally as a trouble condition and transmit missing fire reports if programmed during this condition.

POPIT Modules monitor their sensor loops for three conditions: loop normal, loop open, and loop shorted. They report these three conditions to the control panel.

The D9412G/D7412G uses point programming to interpret the sensor loop information reported by the POPITs and make the appropriate system response.

8.2 D8125, D8127 and D9127 POPIT Modules

D8127 and D9127 POPITs use the D8125 POPEX Module to report to the panel. Each D8125 supports up to 119 POPIT points. Connect two D8125 Modules to the D9412G to bring the combined total number of POPIT and on-board points to 246. Points 9 to 127 connect to the first POPEX Module. Points 129 to 247 connect to the second POPEX Module. The D9412G reserves Points 128 and 248 for internal use. The panel only annunciates activity for each POPIT, not each detection device connected to the sensor loop.

There are two versions of the D8127 and D9127 Modules. Both module enclosures are made of UL listed fire resistant material. D8127T and D9127T Modules contain tamper switches. D8127U and D9127U Modules come with untampered covers. Unless the module is mounted in a tampered enclosure, UL requires D8127T and D9127T Modules for certificated accounts.

8.2.1 Listings

The D8125 POPEX and the D8127 and D9127 POPIT Modules are UL listed for Local or Police Connected Burglar Alarm, Central Station Burglar Alarm, Household Burglar Alarm, Central Station Fire, Local Fire, Remote Station Fire, Household Fire and Electrically Actuated Transmitter Applications. See the *D9412G/D7412G Approved Applications Compliance Guide* to determine the required equipment and enclosures for the application.

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Off-board Points

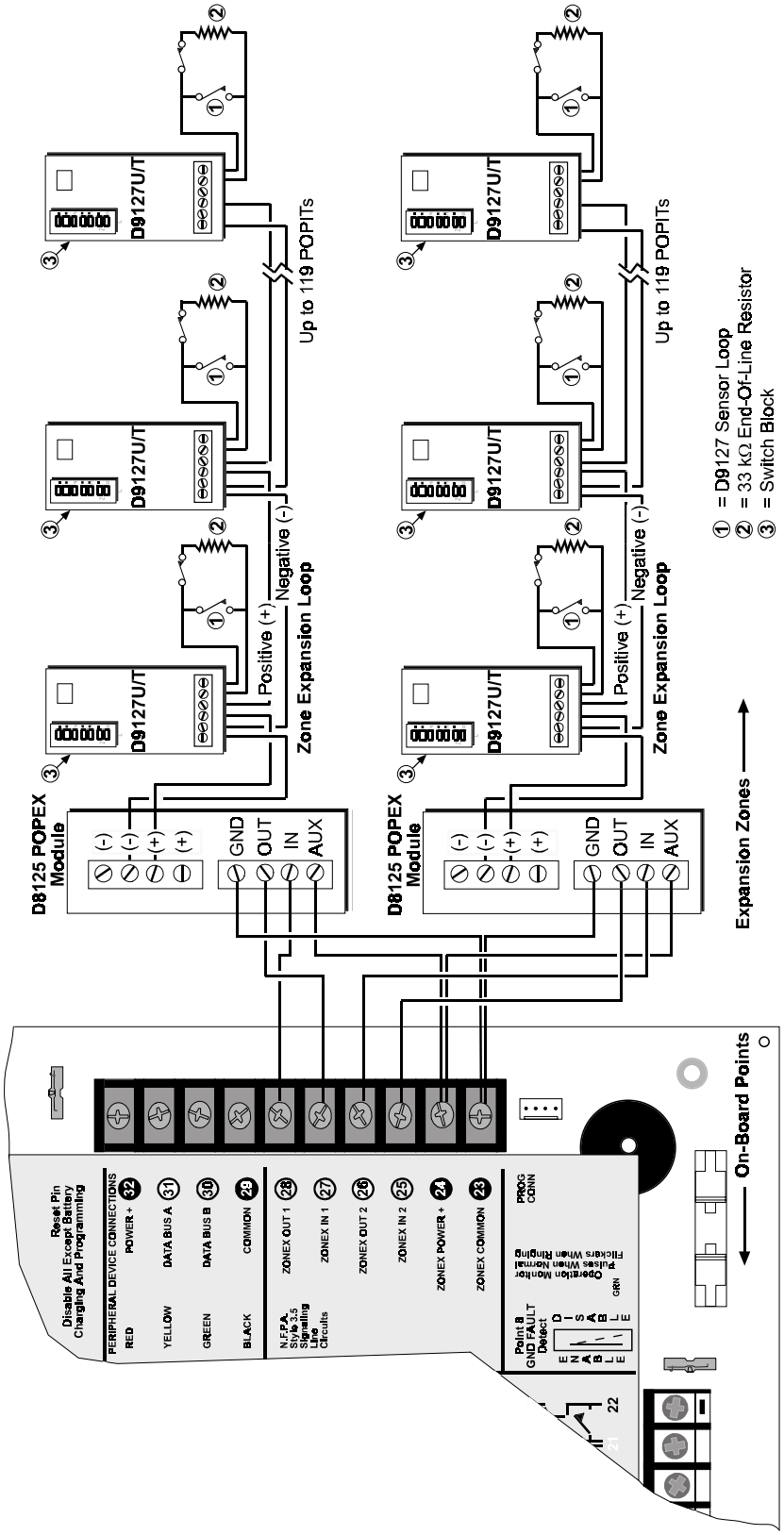

Figure 14a: Connecting the D8125 POPEX to the D9412G Panel

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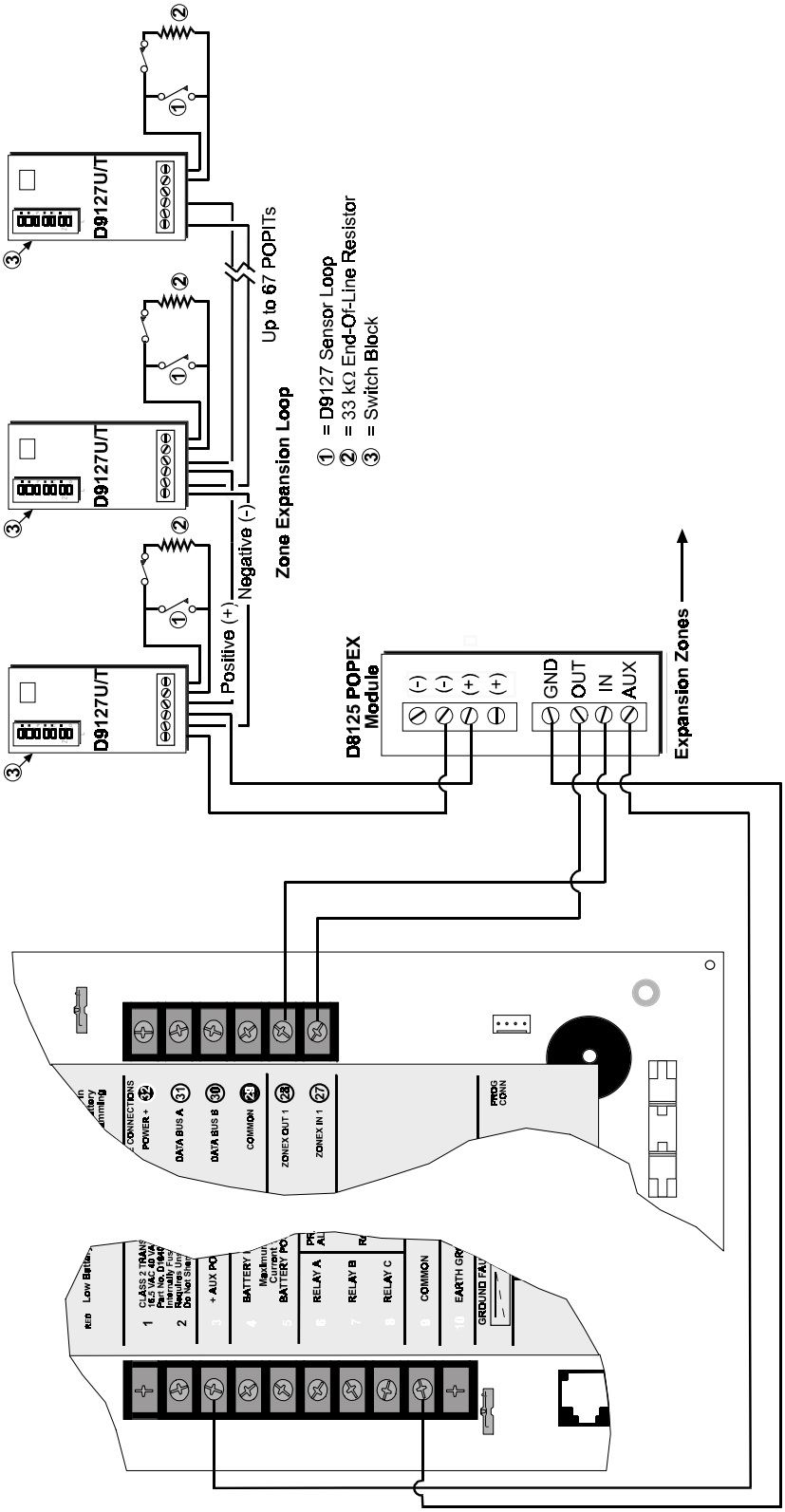

Figure 14b: Connecting the D8125 POPEX to the D7412G Panel

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8.3 Installing the D8125 POPEX Module

IMPORTANT

***For information on the Multiplex Bus Interface, see the* D8125MUX Multiplex Bus Interface Operation & Installation Manual.**

Save the POPIT Label Sheets: The D8125 is packaged with two sets of POPIT label sheets. One is marked for use with the D9412/D9112. Save this set for use with the D9412G/D7412G. It will be used later to label the POPITs.

8.3.1 Mounting

Use the following procedure to install the D8125 in the enclosure with the panel:

1. Align the D8125 POPEX Module with any of the four mounting locations in the enclosure. See *Figure 2*.
2. Use the screws provided with the module to secure it in the enclosure.

8.3.2 Wiring the D8125 to the Control/Communicator

Follow the procedure below to wire one or two D8125 Modules to the panel. See *Figure 14a* and *Figure 14b*.

Power down first: Power down the panel by disconnecting the positive (red) battery lead at the battery and unplugging the transformer.

For Points 9 to 127 (9 to 75 on D7412G):

1. Connect the GND terminal of the D8125 to Terminal 23 on the D9412G or to Terminal 9 on the D7412G.
2. Connect the OUT terminal of the D8125 POPEX Module to ZONEX IN 1, Terminal 27.
3. Connect the IN terminal of the D8125 POPEX Module to ZONEX OUT 1, Terminal 28.
4. Connect the AUX terminal of the D8125 to Terminal 24 on the D9412G or to Terminal 3 on the D7412G.

For Point numbers from 129 to 247 (D9412G only):

1. Connect the GND terminal of the D8125 to Terminal 23.
2. Connect the OUT terminal of the D8125 POPEX Module to ZONEX IN 2, Terminal 25.
3. Connect the IN terminal of the D8125 POPEX Module to ZONEX OUT 2, Terminal 26.
4. Connect the AUX terminal of the D8125 to Terminal 24.

See section *8.3.4 Wiring Data Expansion Loops to POPEX Modules* for instructions on connecting POPITs to the D8125 POPEX Module.

8.3.3 Wiring POPITs to the Data Expansion Loop

Use one 2-wire data expansion loop or distribute the POPITs on up to three loops. Setting DIP switches on the POPIT Modules assigns them to point numbers. See section *8.3.6 POPIT Module Point Assignments.*

Review section *3.6.2 Install and Wire Detection Devices* to determine if shielded wire is required. Determine the required wire gauge for the length of each data expansion loop using *Table 8*.

Combine data expansion loops: The maximum lengths shown in *Table 8* are for all data expansion loops connected to the same POPEX Module combined.

Maximum Length of all Data Expansion Loops Combined	
AWG	**Length in feet (meters)**
22	1,800 (548)
20	2,890 (881)
18	4,600 (1,402)
16	7,320 (2,231)
14	11,650 (3,551)

Table 8: Data Expansion Loop Wire Specifications

IMPORTANT

Before installing the POPITs, make sure the resistance on the data expansion loop is no more than 40 Ω..

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Wiring POPITs together: Do NOT connect POPITs to each other in series, or with a T-tap. Doing so may cause random missing POPIT conditions. Follow the procedure below to connect POPITs to one another in parallel.

1. Connect the positive (+) Data terminal from one POPIT to the positive (+) Data terminal on the next POPIT.
2. Connect the negative (-) Data terminal from one POPIT to the negative (-) Data terminal on the next POPIT.
3. Repeat steps 1 and 2 to connect all POPITs to the expansion loop. The POPITs don't need to be wired in any particular order on the loop. The switch setting on each POPIT assigns it a point number, regardless of its physical location.

Three inch clearance for tampered POPITs: Mount tampered POPIT Modules at least three inches apart to prevent the tamper magnets from interfering with each other.

8.3.4 Wiring Data Expansion Loops to POPEX Modules

There are two positive (+) and two negative (-) data expansion loop terminals on each POPEX Module. Follow the procedure below to connect the data expansion loops to the D8125 POPEX Module (see *Figure 14a* and *Figure 14b)*. Remember, a maximum of 119 POPITs can be connected to one D8125 on the D9412G and 67 for the D7412G.

1. Connect the positive (+) Data terminal from the first POPIT on the data expansion loop to one of the D8125 Module's positive (+) terminals.
2. Connect the negative (-) Data terminal from the first POPIT on the data expansion loop to one of the D8125 Module's negative (-) terminals.

8.3.5 POPIT Sensor Loops

The number of normally-open and/or normally-closed detection devices each sensor loop can supervise is limited only by the resistance on the loop. Resistance on each sensor loop must be less than 100 Ω not including the EOL resistor.

Certain UL and NFPA applications may limit the number of detection devices. Consult the appropriate UL or NFPA standards.

POPITs detect open, shorted, normal, and grounded circuit conditions on their sensor loops. They transmit the condition of their loops to the panel. A ground on the sensor loop reports as a general system ground fault condition (see *Ground Fault* in the *D9412G/D7412G Installation and Troubleshooting Quick Reference Guide)*. Each POPIT is programmed and transmits to the panel separately.

Terminate each POPIT sensor loop with the 33 kΩ end-of-line resistor [D106F) included with each POPIT.

Radionics recommends the use of twisted-pair wire (six twists per foot) in all POPEX/POPIT installations for both the data expansion loop wiring and the POPIT sensor loops. Run wires away from AC sources to prevent AC induction. If a noisy environment is suspected, use shielded cable. See section *8.3 Installing the D8125 POPEX Module.*

8.3.6 POPIT Module Point Assignments

Six switches on each POPIT assign the module to a point number. POPIT switch settings are found in *Point Assignment* in the *D9412G/D7412G Program Record Sheet*. See *Figure 15*.

For the D9412G, Points 73 to 127 and 193 to 247 must use the D9127 POPITs. Points 9 to 72 and 129 to 192 may use either D8127 or D9127 POPITs. For the D7412G, Points 9 to 72 may use either D8127 or D9127 POPITs; however, D9127 POPITs must be used for Points 73-75.

8.3.7 Program Record Sheet

The first column on the *D9412G/D7412G Program Record Sheet* contains the switch settings for the D8127 POPITs. Switches are numbered 1 to 6, left to right on the D8127 POPIT. Switches are numbered 0 to 6, left to right on the D9127 POPIT. Set switches whose number appears in the setting to the ON position. Set switches with a dash (-) in the switch position to the OFF position. See *Figure 15*.

The second column contains the translation of the point number into the ZONEX format. See *Point User Flag* in the *D9412G/D7412G Program Entry Guide* for an explanation of this feature.

The third column contains the point number as it is displayed at command centers.

The fourth column contains the point index. See *Point Index Parameters* in the *D9412G/D7412G Program Entry Guide* for an explanation of the point index.

The fifth column of the Program Record Sheet shows the area the point is assigned to.

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The sixth column shows the Debounce Count for the point. See *Debounce Count* in the *D9412G/D7412G Program Entry Guide*.

The seventh column shows the BFSK report code. It is the point number reported for this point when the panel is using the BFSK format.

The eighth column contains the text displayed at command centers for the point. The text is transmitted to the receiver when the panel is using the Modem IIIa^2 format.

POPIT Labels

Off-board points for the D9412G are numbered 9 to 127 and 129 to 247 (D7412G uses Points 9-75 only). The D9412G reserves Points 128 and 248 for internal use. POPITs must be connected for Points 129 to 247 to expansion loops connected to POPEX #2.

D9412G/D7412G Default values are shown in ( ) or in **bold**

RADXPNTS Handler

Point Assignments (001 through 040)

POPIT Switch Setting	Trans-lation	Point #	Point Index	Area Assign	Debounce	BFSK/ Relay	Custom Point Text
	100	001	__ __	(1) ____	(2) ____	(1) ____	P1 FIRE _____
	200	002	__ __	(1) ____	(2) ____	(2) ____	P2 PANIC _____
	300	003	__ __	(1) ____	(2) ____	(3) ____	P3 DELAY _____
	400	004	__ __	(1) ____	(2) ____	(4) ____	P4 FOLLOW _____
	500	005	__ __	(1) ____	(2) ____	(5) ____	P5 INSTANT _____
	600	006	__ __	(1) ____	(2) ____	(6) ____	P6 INSTANT _____
	700	007	__ __	(1) ____	(2) ____	(7) ____	P7 INSTANT _____
	800	008	__ __	(1) ____	(2) ____	(8) ____	P8 INSTANT _____
0 1 2 3 4 5 6	101	009	__ __	(1) ____	(2) ____	(1) ____	P9 _____
0 1 2 3 4 5 _	102	010	__ __	(1) ____	(2) ____	(1) ____	P10 _____
0 1 2 3 4 _ 6	103	011	__ __	(1) ____	(2) ____	(1) ____	P11 _____
0 1 2 3 4 _ _	104	012	__ __	(1) ____	(2) ____	(1) ____	P12 _____
0 1 2 3 _ 5 6	105	013	__ __	(1) ____	(2) ____	(1) ____	P13 _____
0 1 2 3 _ 5 _	106	014	__ __	(1) ____	(2) ____	(1) ____	P14 _____
0 1 2 3 _ _ 6	107	015	__ __	(1) ____	(2) ____	(1) ____	P15 _____
0 1 2 3 _ _ _	108	016	__ __	(1) ____	(2) ____	(1) ____	P16 _____
0 1 2 _ 4 5 6	109	017	__ __	(1) ____	(2) ____	(1) ____	P17 _____
0 1 2 _ 4 5 _	110	018	__ __	(1) ____	(2) ____	(1) ____	P18 _____
0 1 2 _ 4 _ 6	111	019	__ __	(1) ____	(2) ____	(1) ____	P19 _____
0 1 2 _ 4 _ _	112	020	__ __	(1) ____	(2) ____	(1) ____	P20 _____
0 1 2 _ _ 5 6	113	021	__ __	(1) ____	(2) ____	(1) ____	P21 _____

Figure 15: Program Record Sheet

Two sheets of peel-off POPIT labels are supplied with the D8125 POPEX Module. Use the sheet marked *Bank1* for Points 9 to 127. Use the sheet marked *Bank2* for Points 129 to 247.

Each label has two parts. Place the smaller part, with just the point number on it, on the chip. Place the larger part with the switch settings on the base of the POPIT. Set the switches and cover the POPIT.

Do not program two POPITs for the same point number. After programming all the points, perform a service walk test. The *D9412G/D7412G Installation and Troubleshooting Quick Reference Guide* contains instructions for performing a service walk test. If a point does not test, check the programming for a duplicated address.

Walk test does not show extra points: Only the Service Walk Test shows extra points. If the point assignment switches on a POPIT or OctoPOPIT are set incorrectly, it may create both missing and extra points. If the same point number is assigned to two or more POPITs or OctoPOPITs, none of the points with that number will test correctly.

8.4 D8128D OctoPOPIT Module

D8128, D8128A or D8128B modules are not compatible with the D9412G or D7412G. Only use the D8128D OctoPOPIT module. Using D8128, D8128A or D8128B modules may cause intermittent missing and restoral reports.

8.4.1 Description

The D8128D OctoPOPIT Module combines the functions of the D8125 POPEX module and the D8127/D9127 POPIT modules to provide eight off-board points in a single module. You can wire both D8128D OctoPOPIT and D8125 POPEX modules in parallel to the ZONEX Bus terminals on the same panel.

Review section *5.0 Power Outputs* to be sure to provide enough power for the OctoPOPITs and other powered devices that will be connected to the system.

8.4.2 Listing

The D8128D OctoPOPIT Module is UL listed for Local or Police Connected Burglary Alarm, Central Station Burglary Alarm, and Household Burglary Alarm applications. The D8128D is also suitable for fire supervisory applications, such as indicating circuit supervision (using the D192C Bell Circuit Supervision Module), sprinkler supervision, and valve tamper protection.

Do not connect fire alarm initiating devices directly to the D8128D.

You must use the D125B Dual Class B Powered Loop Interface Module or D129 Dual Class A Initiation Circuit Module for fire initiation applications. Connect the initiating devices, smoke detectors for example, to the D125B powered loops or D129 Class A loops.

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Connect the zone outputs on the D125B or D129 to the OctoPOPIT sensor loop inputs. The D125B or D129 and the OctoPOPIT must be mounted in the enclosure with the panel or in a separate enclosure connected to the panel's enclosure by conduit not more than 20 ft. (6 m) in length.

8.4.3 Installing the OctoPOPIT

You can install the D8128D OctoPOPIT Module in the enclosure with the panel, or in a separate enclosure (model D8103, D8108A, or D8109) up to 200 ft. (61 m) from the panel using standard four-conductor 22 AWG (0.8 mm) wire. If you mount the OctoPOPIT in a separate enclosure, use shielded cable to avoid electro-magnetic interference. See *EMI on Long Wire Runs* in the *D9412G/D7412G Installation and Troubleshooting Quick Reference Guide*.

Tampered enclosures for UL certificated systems: The D125B or D129 and the OctoPOPIT must be mounted in the enclosure with the panel or in a separate enclosure connected to the panel's enclosure by conduit not more than 20 ft. (6 m) in length.

Mounting

Follow the procedure below to install OctoPOPITs in the enclosure.

1. It is easier to set the switches on the D8128D before mounting it in the enclosure. See section *8.4.5 Line Termination* and section *8.4.7 Address Assignment Switches.*
2. Align the OctoPOPIT Module with any of the four mounting locations in the enclosure. See *Figure 2*.
3. Use the screws provided with the module to secure it in the enclosure.

Use the D137 Mounting Bracket to install OctoPOPITs in enclosures with no module mounting locations available.

8.4.4 Wiring OctoPOPITs

Follow the procedure below to wire D8128D OctoPOPIT Modules to the D9412G/D7412G. Both OctoPOPIT and POPEX Modules can be connected to the same Point Bus terminals. The modules wire in parallel. Remember **never** assign the same point number to more than one point.

1. ***Power down first:*** Power down the panel by disconnecting the positive (red) battery lead at the battery and unplugging the transformer.
2. Connect Terminal 1 on the OctoPOPIT to Terminal 23 on the D9412G (Terminal 9 on the D7412G).
3. Connect Terminal 2 on the OctoPOPIT to Terminal 28 on the panel if assigning point numbers from 9 to 127 (or 9 to 75 if using a D7412G) to this OctoPOPIT. See section *8.4.7 Address Assignment Switches.*

   If assigning point numbers from 129 to 247, connect Terminal 2 on the OctoPOPIT to Terminal 26 on the D9412G.
4. Connect Terminal 3 on the OctoPOPIT to Terminal 27 on the D9412G if assigning point numbers from 9 to 127 (or 9 to 75 if using a D7412G) to this OctoPOPIT.

   If assigning point numbers from 129 to 247, connect Terminal 3 on the OctoPOPIT to Terminal 25 on the D9412G.
5. Connect Terminal 4 on the OctoPOPIT to Terminal 24 on the D9412G (Terminal 3 on the D7412G).
6. See section *8.4.6 OctoPOPIT Sensor Loops* for instructions on connecting devices to the OctoPOPIT's sensor loops.

8.4.5 Line Termination

Switch 5 sets line termination.

- If there is no D8125 POPEX module connected to ZONEX 1, set switch 5 of only one D8128D connected to those terminals to the ON position.
- If there is a D8125 POPEX module connected to ZONEX 1, set switch 5 of all D8128Ds connected to those terminals to the OFF position.
- If there is no D8125 POPEX module connected to ZONEX 2, set switch 5 of only one D8128D connected to those terminals to the ON position.
- If there is a D8125 POPEX module connected to ZONEX 2, set switch 5 of all D8128Ds connected to those terminals to the OFF position.

See *Figure 14a* and *Figure 14b* for the location of the switches on the OctoPOPIT.

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8.4.6 OctoPOPIT Sensor Loops

Only the resistance on the loop limits the number of normally-open and/or normally-closed detection devices each sensor loop can supervise. Resistance on each sensor loop must be less than 100 ohms with the detection devices connected.

Certain UL and NFPA applications may limit the number of detection devices. Consult the appropriate UL or NFPA standards.

The OctoPOPIT detects open, short, closed, normal, and grounded circuit conditions on its sensor loops and transmits the conditions to the panel. A ground on the positive leg of the sensor loop transmits a shorted condition for the point. Each sensor loop is assigned a point number and transmits to the panel separately.

Radionics recommends you use twisted-pair wire for the OctoPOPIT sensor loops to avoid EMI problems. Run wires away from the premises telephone and AC wiring. If you suspect a noisy environment, use shielded cable.

There are two rows of terminal numbers on the OctoPOPIT. In the row closest to the terminal blocks, the positive outputs for the sensor loops are labeled P1 to P8. Sensor loop outputs P1 and P2, P3 and P4, P5 and P6, and P7 and P8 share common terminals. The common terminals for each pair are labeled COM.

Terminate each OctoPOPIT sensor loop with a 1 kΩ end-of-line resistor. Attach a resistor even if you don't enable the loop. The OctoPOPIT comes with a D105BL resistor for each sensor loop.

Take care not to duplicate point assignments. Points assigned to both an OctoPOPIT sensor loop and a POPIT, two OctoPOPIT sensor loops, or two POPITs do not function properly.

8.4.7 Address Assignment Switches

Switches 1, 2, 3, and 4 assign the OctoPOPIT sensor loops to point numbers on the panel. *Table 9* shows the OctoPOPIT switch settings for point assignments.

ZONEX 1	D8128D Address Switches					ZONEX 2
Points 9-127	**1**	**2**	**3**	**4**	**5**	**Points 129-247**
9-16	ON	ON	ON	ON	*	129-136
17-24	ON	ON	ON	OFF	*	137-144
25-32	ON	ON	OFF	ON	*	145-152
33-40	ON	ON	OFF	OFF	*	153-160
41-48	ON	OFF	ON	ON	*	161-168
49-56	ON	OFF	ON	OFF	*	169-176
57-64	ON	OFF	OFF	ON	*	177-184
65-72	ON	OFF	OFF	OFF	*	185-192
73-80	OFF	ON	ON	ON	*	193-200
81-88	OFF	ON	ON	OFF	*	201-208
89-96	OFF	ON	OFF	ON	*	209-216
97-104	OFF	ON	OFF	OFF	*	217-224
105-112	OFF	OFF	ON	ON	*	225-232
113-120	OFF	OFF	ON	OFF	*	233-240
121-127	OFF	OFF	OFF	ON	*	241-247

** Line Termination Switch (see section 8.4.5 for line termination switch settings)*

Table 9: D8128D OctoPOPIT Switch Settings for D9412G/D7412G

***Note**: For the D8128D OctoPOPITs assigned to Points 121-127 and 241-247, be sure to set Point Input Switch 8 to the OPEN position.*

Dipswitch 4 is not used for setting addresses. See section 8.4.5 Line Termination *for further instructions.*

D9412G uses Points 9-127 on ZONEX 1 and Points 129-247 on ZONEX 2.

D7412G uses Points 9-75 on ZONEX 1 only.

8.5 Testing Off-board Points

Use the Service Walk Test to test off-board points. See the *D9412G/D7412G Installation and Troubleshooting Quick Reference Guide* for instructions. Test to be sure that all off-board points operate properly.

Walk test does not show extra points: Only the Service Walk Test shows extra points. If the point assignment switches on a POPIT or OctoPOPIT are set incorrectly, it may create both missing and extra points. If the same point number is assigned to two or more POPITs or OctoPOPITs, none of the points with that number will test correctly.

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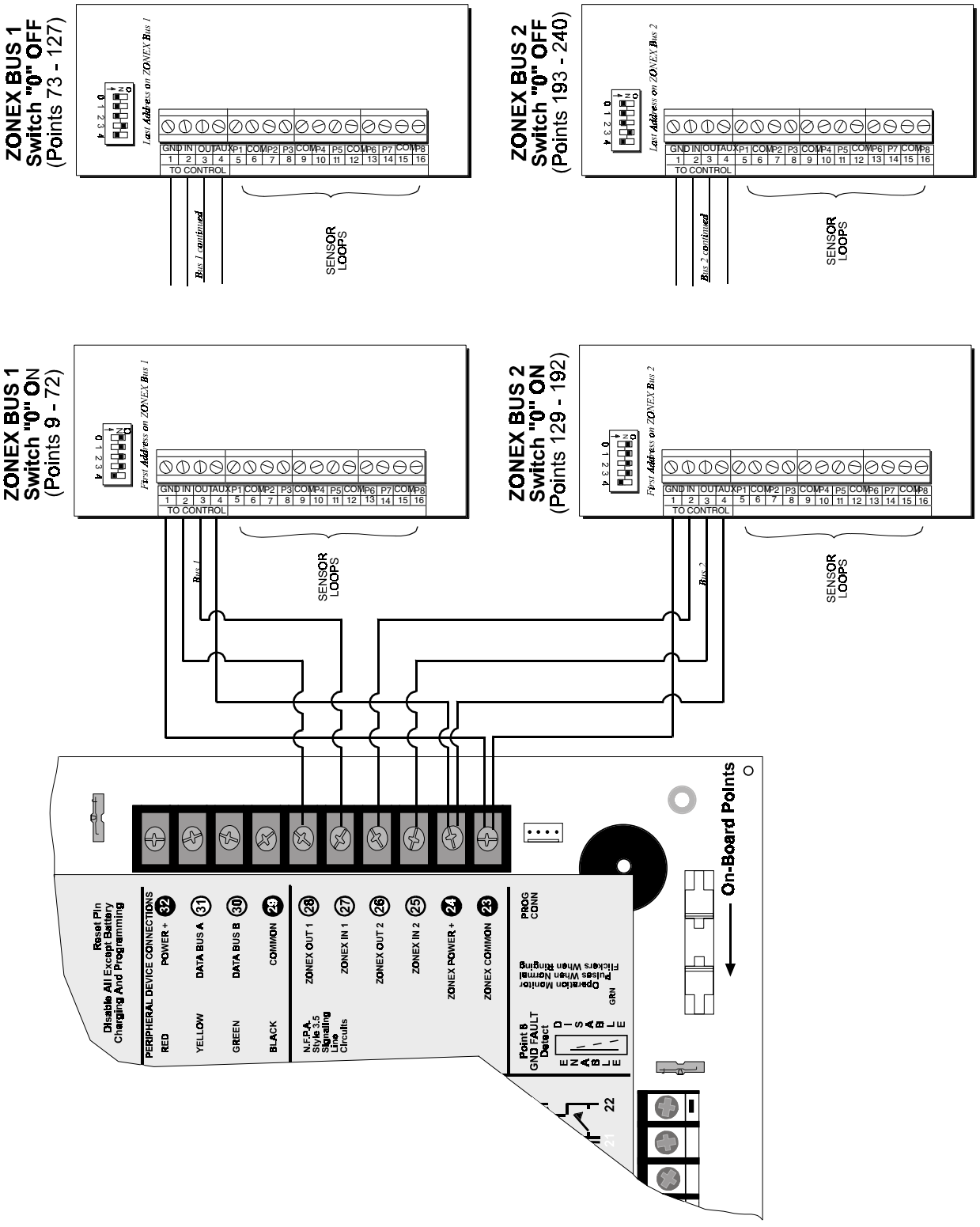

Figure 16a: Connecting D8128D OctoPOPITs to the D9412G

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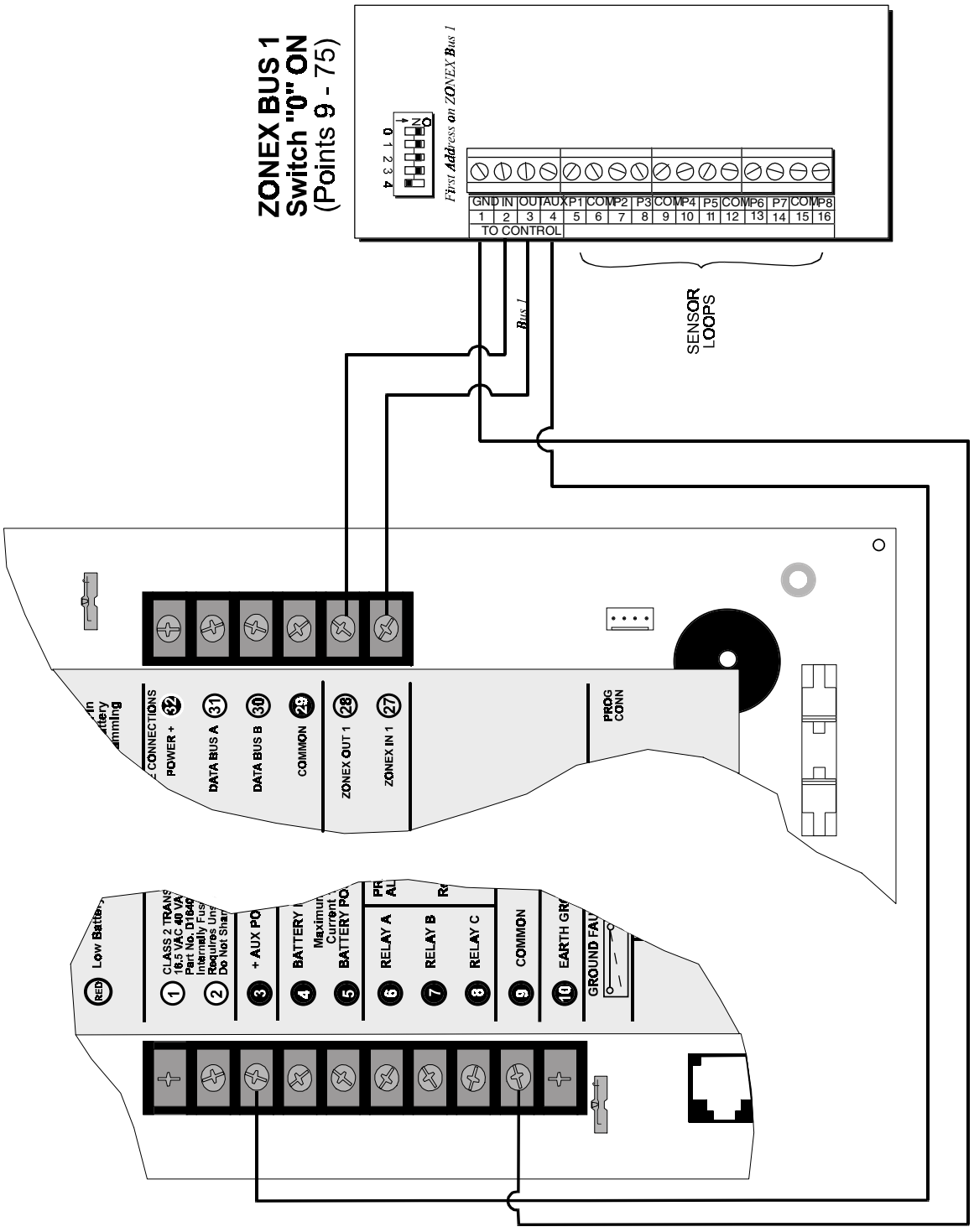

Figure 16b: Connecting D8128D OctoPOPITs to the D7412G

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9.0 Off-board Relays

9.1 D8129 OctoRelay

The D8129 OctoRelay allows the addition of relay outputs to the system in groups of eight. On the D9412G, up to 128 OctoRelay outputs (relay numbers 1 to 128) can be added to the system using 16 OctoRelays. The D7412G allows up to 64 relay outputs. Review section *5.0 Power Outputs* to be sure to provide enough power for the OctoRelays and other powered devices that will be connected to the system.

OctoRelays for relay numbers 1 - 64 connect to ZONEX 1, Terminal 28. OctoRelays for relay numbers 65-128 connect to ZONEX 2 (D9412G only), Terminal 26 on the D9412G. See *Figure 17a* and *Figure 17b*.

Alarm output, auxiliary relay, sensor reset, arming status, point status, alarm memory, or remote functions can be assigned to the OctoRelay outputs individually. See *Relay Parameters* in the *D9412G/D7412G Program Entry Guide* for programming details.

D8129 restricted for fire systems: The D8129 relay outputs are not supervised and can not be used in fire or combined fire/burglary installations for primary indicating devices.

9.1.1 Configuring the D8129 OctoRelay

Five switches on the OctoRelay determine the relay numbers for the eight relay outputs. *Table 10* shows the switch settings.

Relay outputs may activate while setting the OctoRelay switches or programming the panel. You may wish to disconnect equipment connected to relay outputs while performing these functions.

9.1.2 Relay Outputs

Each OctoRelay output provides a Form C dry contact rated for 1.0 A at 12 VDC. Normally-open, common, and normally-closed terminals are available for each relay output. When an individual output is activated, there is continuity between the normally-open and common terminals. When the output is not activated, there is continuity between the normally-closed and common terminals.

9.1.3 Installation

Set the switches on the OctoRelay before installing it in the enclosure. See *section 9.1.1 Configuring the D8129 OctoRelay*. Install the OctoRelay in the enclosure with the panel (see *Figure 2*) or in an adjacent enclosure **NOT MORE THAN 5 FT. (1.5 M)** from the panel. Use 16 to 22 AWG wire.

Follow the procedure below to install OctoRelays in the enclosure with the panel.

1. Align the module with one of the mounting locations in the enclosure. See *Figure 2*.
2. Use the screws provided with the module to secure it in the enclosure.

Panel Relay Number	D8129 OctoRelay Switch Setting	On Panel, Connect D8129 to:
1 to 8	Off-On-On-On-On	ZONEX 1 Terminal 28
9 to 16	On-Off-On-On-On	ZONEX 1 Terminal 28
17 to 24	Off-Off-On-On-On	ZONEX 1 Terminal 28
25 to 32	On-On-Off-On-On	ZONEX 1 Terminal 28
33 to 40	Off-On-Off-On-On	ZONEX 1 Terminal 28
41 to 48	On-Off-Off-On-On	ZONEX 1 Terminal 28
49 to 56	Off-Off-Off-On-On	ZONEX 1 Terminal 28
57 to 64	On-On-On-Off-On	ZONEX 1 Terminal 28
D7412G maximum		
65 to 72	Off-On-On-On-On	ZONEX 2 Terminal 26
73 to 80	On-Off-On-On-On	ZONEX 2 Terminal 26
81 to 88	Off-Off-On-On-On	ZONEX 2 Terminal 26
89 to 96	On-On-Off-On-On	ZONEX 2 Terminal 26
97 to 104	Off-On-Off-On-On	ZONEX 2 Terminal 26
105 to 112	On-Off-Off-On-On	ZONEX 2 Terminal 26
113 to 120	Off-Off-Off-On-On	ZONEX 2 Terminal 26
121 to 128	On-On-On-Off-On	ZONEX 2 Terminal 26

Table 10: D8129 OctoRelay Switch Settings

Use the D137 Mounting Bracket or D9002 Mounting Skirt to install OctoRelays in enclosures with no module mounting locations available.

9.1.4 Wiring Connections

Power down the panel to connect OctoRelays as shown in *Figure 17a* and *Figure 17b*. Note that OctoRelays for relay numbers 1 to 64 connect to ZONEX 1, Terminal 28. OctoRelays for relay numbers 65 to 128 connect to ZONEX 2, Terminal 26 on the D9412G.

Only one OctoRelay is shown wired to each ZONEX bus in *Figure 17a* and *Figure 17b*. Wire additional OctoRelays in parallel. Review section *5.0 Power Outputs* to be sure to provide enough power for the relays.

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Off-board Relays

The number of D8129 OctoRelays that can be connected to each Zonex terminal on the D9412G panels is limited by the number of D8128D OctoPOPITs connected.

WARNING

Using D8129 OctoRelays and D8128D OctoPOPITs together on the same Zonex Terminals is limited and depends on the number of D8128D OctoPOPITs and D8129 OctoRelays connected to a single Zonex Bus. Refer to* Table 11 *for information on the maximum number of D8128Ds and D8129s that may be connected to a single Zonex Bus.

If the # of D8128Ds connected to a single ZONEX bus is:	Then do not connect more than this # of D8129s:
9	6
10	5
11	4
12	3
13	1
14	1

Table 11: Number of D8128Ds used with D8129s

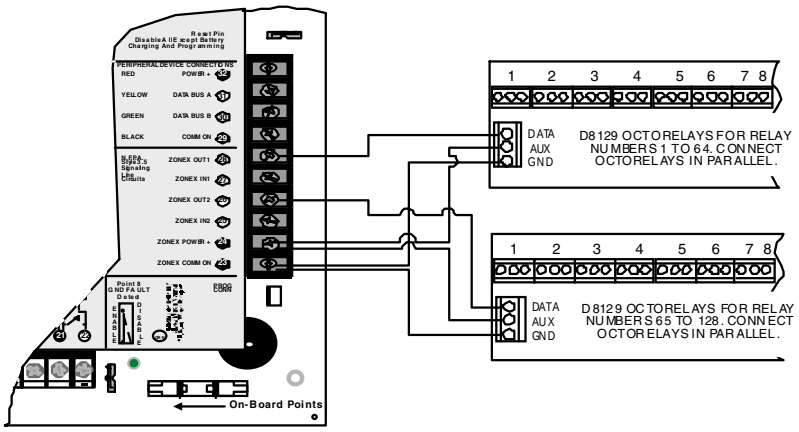
1 2 3 4 5 6 7 8
DATA
AUX
GND
D8129 OCTORELAYS FOR RELAY NUMBERS 1 TO 64. CONNECT OCTORELAYS IN PARALLEL.
1 2 3 4 5 6 7 8
DATA
AUX
GND
D8129 OCTORELAYS FOR RELAY NUMBERS 65 TO 128. CONNECT OCTORELAYS IN PARALLEL.
On-Board Points

Figure 17a: D8129 Connections to the D9412G

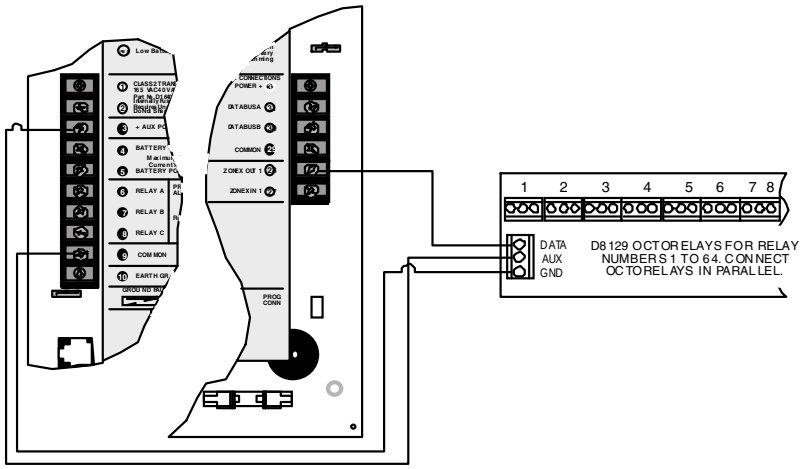

Figure 17b: D8129 Connections to the D7412G

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9.2 D811 Arm Status Relay Module

The D811 Arm Status Relay Module allows the addition of a single off-board relay output to the system. Alarm output, auxiliary relay, sensor reset, arming status, point status, alarm memory, or remote functions can be assigned to the D811 relay output. It is not restricted to the arming status mode only.

Relay numbers for D811 not programmable: If the D811 is connected to ZONEX 1, Terminal 28, relay number 53 must be used for the relay output. If the D811 is connected to ZONEX 2, Terminal 26 on the D9412G, relay number 117 must be used for the relay output.

D811 Modules connect as shown in *Figure 18a* and *Figure 18b*. Review section *5.0 Power Outputs* to be sure to provide enough power for the powered devices that will be connected to the system. See *Relay Parameters* in the *D9412G/D7412G Program Entry Guide* for programming details.

D811 restricted for fire systems: The D811 relay output is not supervised and cannot be used in fire or combined fire/burglary installations for primary indication devices.

9.2.1 Relay Output

Each D811 relay output provides a Form C dry contact rated for 1.0 A at 12 VDC. Normally-open, common, and normally-closed terminals are available. When an individual output is activated, there is continuity between the normally-open and common terminals. When the output is not activated, there is continuity between the normally-closed and common terminals.

Relay outputs may activate while programming the panel. You may wish to disconnect equipment connected to relay outputs while performing these functions.

9.2.2 Installation

Install the D811 in the enclosure with the panel (see *Figure 2*) or in an adjacent enclosure NOT MORE THAN 5 FT. (1.5 M) **from the panel. Use 16 to 22 AWG wire.**

Follow the procedure below to install D811 Modules in the enclosure with the panel.

1. Align the D811 Module with any of the four mounting locations in the enclosure. See *Figure 2*.
2. Use the screws provided with the module to secure it in the enclosure.

Use the D137 Mounting Bracket or D9002 Mounting Skirt to install D811 Modules in enclosures with no module mounting locations available.

9.2.3 Wiring Connections

Power down the panel to connect D811 Modules as shown in *Figure 18a* and *Figure 18b*. Note that the D811 for relay number 53 connects to ZONEX 1. The D811 for relay number 117 connects to ZONEX 2 on the D9412G.

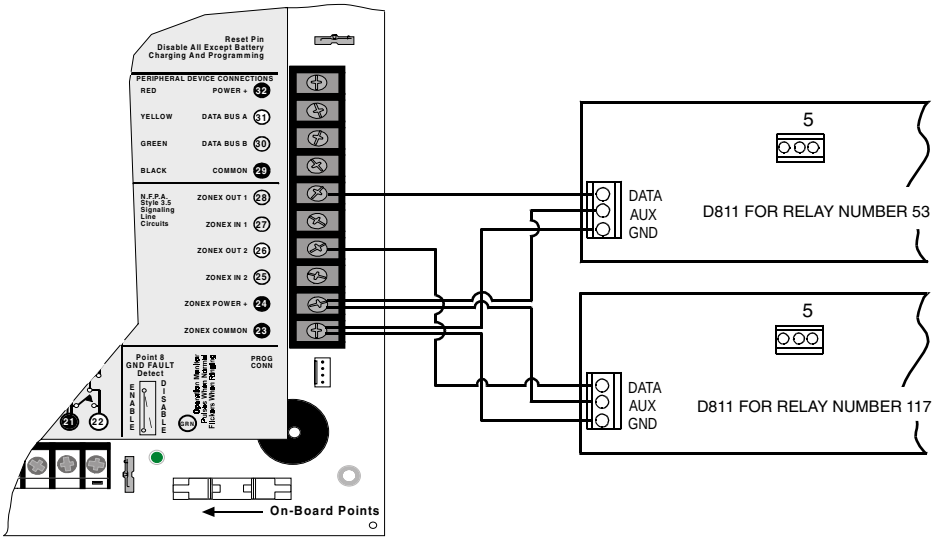

Figure 18a: D811 Module Wiring to the D9412G

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Off-board Relays

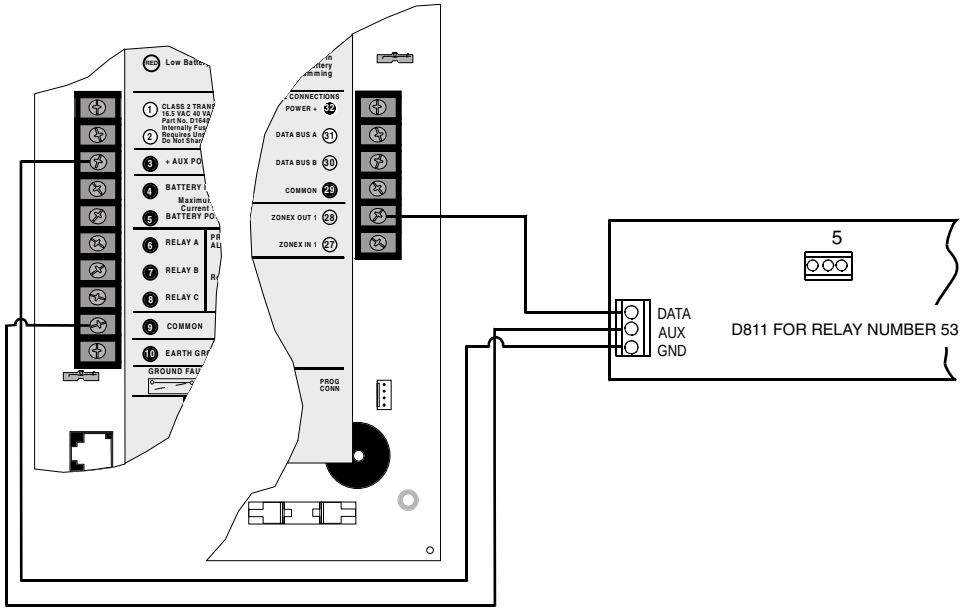

Figure 18b: D811 Module Wiring to the D7412G

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10.0 Arming Devices

10.1 Description

Command centers, maintained or momentary contact keyswitches, or a combination of the two are used to arm and disarm areas. The panel may contain up to 8 areas. See section *2.4.2 Areas and Accounts* for a description of areas.

10.2 Command Center Terminals 29 to 32

The Radionics command center is a 4-wire powered device used to arm and disarm areas, annunciate complete system status, initiate system tests, and control many functions of the security system.

The system can supervise up to eight command centers. The panel transmits a serial device trouble report, `SDI FAILURE` in the Modem IIIa^2 format or `TROUBLE ZN D` in the BFSK format, if it loses communication with a supervised command center. `CALL FOR SERVICE` appears in any command center with text display capability that loses communication with the panel. `SERVC KEYPAD` appears at all other command centers connected to the system.

A total of 32 command centers can be connected to the system. The number of supervised command centers, number of areas, and the available power affect the total number of command centers that can be connected to the system. See *Command Center* in the *D9412G/D7412G Program Entry Guide* for complete programming details on command center options.

There are five types of command centers available for use with the system. The D1255 features a 16-character alphanumeric display for general use. The D1256 is also a text display command center with functional keys optimized for local fire alarm control. The D1257 is a text display command center for fire annunciation. The D1260 boasts an easy-to-read 4-line by 20-character LCD display with eight “Soft” keys for displaying simple selections. The D720 is an LED display command center appropriate for use as a single area command center with up to eight points.

The D1255 and D720 are also available in white (P/Ns D1255W and D720W) or red (P/Ns D1255R and D720R) versions as well.

See the command center’s *User’s Guide* for operational information.

10.2.1 Assigning the command center an address

Switches on the command center assign an address (1 to 8) to the command center. The address determines if the command center is supervised, the command center's scope, and what area the command center is assigned to. See *Command Center Assignment* in the *D9412G/D7412G Program Entry Guide* for a complete description of addresses.

Table 12 shows the correct switch setting for each address.

Address	Switch					
	1	2	3	4	5	6
Address #1	ON	ON	ON	ON	Encoding Tone ON/OFF	ON
Address #2	OFF	ON	ON	ON		ON
Address #3	ON	OFF	ON	ON		ON
Address #4	OFF	OFF	ON	ON		ON
Address #5	ON	ON	OFF	ON		ON
Address #6	OFF	ON	OFF	ON		ON
Address #7	ON	OFF	OFF	ON		ON
Address #8	OFF	OFF	OFF	ON		ON

Table 12: Command Center Address Settings

10.2.2 Installation

Consult the command center installation manuals for installation and mounting instructions. Command centers connect to the panel in parallel as shown in *Table 13*.

D9412G		Command Center	
Terminal	Function	Wire Color	Function
32*	POWER +	Red	12 VDC
31	DATA BUS A	Yellow	Data-In
30	DATA BUS B	Green	Data-Out
29	COMMON	Black	Common
** Connect with at least 5 ft. (1.5 m) of 22 AWG wire (14 ft. [4.3 m] of 18 AWG wire).*			

Table 13: Command Center Connections

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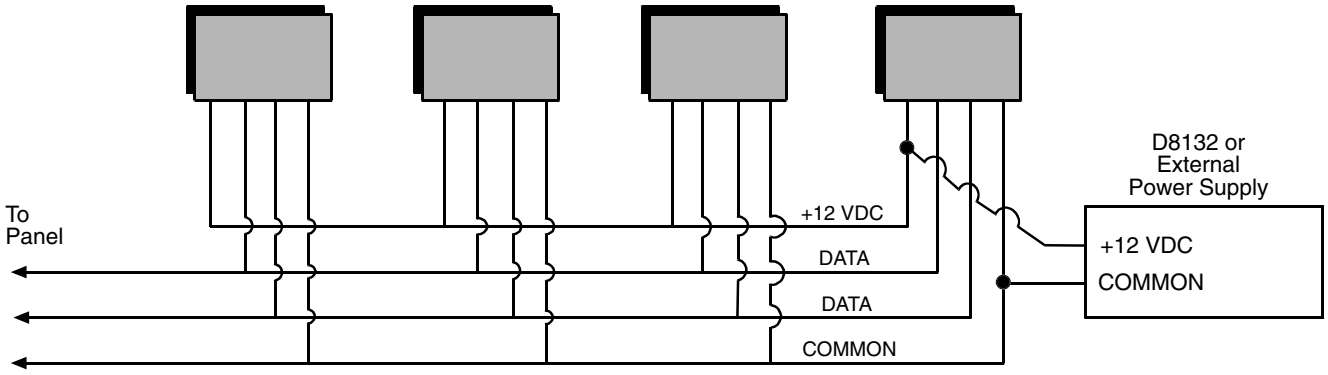

Figure 19: Power at Command Centers

Switching the green and yellow wires affects other command centers: Incorrectly connecting the green wire from the command center to Terminal 31 and the yellow wire to Terminal 30, causes other command centers connected to the panel to go blank and/or sound random beep tones.

Devices can be connected to the data bus, Terminals 30 and 31, by parallel wire runs from the panel to each device, wire from device to device, or a combination of the two as long as a maximum of 15,000 ft. (4,572 m) of 22 AWG wire ***for all devices connected to the SDI Bus combined*** is used.

It is recommended, however, that command centers be limited to **2,000 ft. (610 m)** per run; D9210B Modules be limited to **1,500 ft. (457 m)** per run (**2,500 ft. [762 m]** if using an external power supply), and the D9131A be limited to **1,000 ft. (305 m)** per run.

Extra power needed for more command centers: The D1255 Command Center draws 104 mA when it is idle. It draws 206 mA with the keys lit and the sounder activated. Review section *5.0 Power Outputs* to determine the total power output requirements for the system.

One or more D8132 Battery Charger/Power Supply Modules may need to be added for the number of command centers that will be used. *Figure 19* shows the D8132 powering command centers in a stand-alone configuration.

For UL certificated accounts use a UL listed power supply. The D8132 is not UL listed as a stand-alone power supply.

IMPORTANT

Control/Communicator and D8132 (or other power supply) must share COMMON: *Note that* Figure 19 *shows the common from the D8132 Module connected to both the command centers' common and the common on the control/communicator. Any stand-alone power supply powering any device connected to the panel must also be connected to a common terminal on the panel.*

If you are using the Ground Fault Detect capability on the D9412G or D7412G Control/Communicators and *an external power supply, make sure that the external power supply selected isolates its Earth Ground connection from the negative side of the Aux Power output. External power supplies that do not isolate Earth Ground will cause ground fault conditions on the Control/Communicator.*

10.3 D268/D269 Independent Zone Control, D279A Independent Zone Control

Any ***on-board*** or ***OctoPOPIT*** point can be programmed so that the D268/D269 or D279A Independent Zone Control operates as independent point control (arms and disarms the point).

See the *Point Assignments* in the *D9412G/D7412G Program Entry Guide* for programming information. See the *D268/D269 Operation and Installation Instructions* (P/N 74-05439-000) or the *D279A Operation and Installation Instructions* (P/N 46456) for wiring and operation instructions.

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10.4 Keyswitch

10.4.1 Description

A maintained or momentary contact arming station (keyswitch) can be connected to master arm/disarm any of the areas in the system. The keyswitch is connected to an on-board or off-board point's sensor loop. Relays can be programmed to activate arming status LEDs for keyswitch arming stations. See *Relays* in the *D9412G/D7412G Program Entry Guide*.

10.4.2 Programming

See *Point Assignments* in the *D9412G/D7412G Program Entry Guide* for the correct programming for points used for keyswitches.

10.4.3 Installation

For maintained switches, connect the end-of-line resistor for the point at the keyswitch so that the switch opens the circuit when it operates. A short on the circuit produces an alarm if the area is armed and a trouble if it is disarmed. See *Figure 20*.

For momentary switches, connect the end-of-line resistor for the point at the keyswitch so that the switch shorts the resistor when it operates. An open on the circuit produces an alarm if the area is armed and a trouble if it is disarmed. See *Figure 20*.

10.4.4 Keyswitch Operation

Maintained Contact

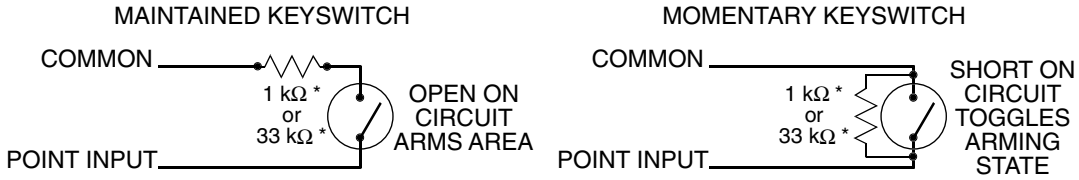
If the point to which the keyswitch is connected is programmed for a maintained contact, an open on the arming circuit arms the area. All faulted points are force armed, regardless of the entry in the ***FA Bypass Max*** program item. Returning the circuit to normal disarms the area. See *Area Parameters* and *Point Assignments* in the *D9412G/D7412G Program Entry Guide*.

Momentary Contact

If the point to which the keyswitch is connected is programmed for a momentary contact, shorting the arming circuit toggles the area's arming state between armed and disarmed. All faulted points are force armed, regardless of the entry in the ***FA Bypass Max*** program item. See *Point Assignments* in the *D9412G/D7412G Program Entry Guide*.

Silencing the Bell

To silence the bell (stop Alarm Bell output) if the system is armed, operate the keyswitch to disarm the area. If the area is disarmed, operate the keyswitch once to start the arming process and a second time to stop the arming process and silence the bell.



* Use 1 kΩ end-of-line resistors if using one of the zones on the panel or an OctoPOPIT.
Use a 33 kΩ resistor if using a POPIT.

Figure 20: Keyswitch Wiring

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Notes:

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11.0 SDI Devices

11.1 Description

The D9412G/D7412G panels can support a number of accessory devices off the SDI bus using Terminals 29 through 32. Some devices include the D1255 Command Center (discussed in the previous section), the D9131A Parallel Printer Interface Module, the D9210B Wiegand™ Control Interface Module, the D9133 Serial Interface Module, and the D9133TTL-E Network Interface Module.

11.2 Installation

Consult the *Operation and Installation Guide* of the specific SDI device for complete installation instructions. SDI devices connect to the panel in parallel as shown in *Table 14*.

These devices may share power with the panel or be powered by a stand-alone power source.

D9412G/D7412G		SDI Devices	
Terminal	**Function**	**Wire Color**	**Function**
32	POWER +	Red	+12 VDC
31	DATA BUS A	Yellow	Data-In
30	DATA BUS B	Green	Data-Out
29	COMMON	Black	Common

Table 14: SDI Device Connections

IMPORTANT

A stand-alone power supply powering any SDI device must also be connected to a common terminal on the panel. Do not connect the stand-alone power supply's earth ground to Terminal 10 on the panel.

11.3 D9131A Parallel Printer Interface Module

The Radionics D9131A Parallel Printer Interface Module is a 4-wire powered device used to connect a standard parallel printer to a panel. The D9412G can supervise three printers, and the D7412G can supervise one printer. Each printer requires a separate D9131A Parallel Printer Interface Module. The D9131A connects to the printer using a standard parallel printer cable.

11.3.1 Switch Settings

Switches on the D9131A assign a unique address (17 to 19) to each printer. The address determines if the printer is supervised, the printer's scope, and the area to which the printer is assigned. See *Printer Parameters* in the *D9412G/D7412G Program Entry Guide* for a complete description of addresses.

Table 15 shows the correct switch setting for each address.

Printer	Switch					
	1	2	3	4	5	6
17	ON	ON	ON	*	ON	ON
18[=]	OFF	ON	ON	*	ON	ON
19[=]	ON	OFF	ON	*	ON	ON

[=] = D9412G only
* ON = Header and Form Feed
OFF = No Header and No Form Feed

Table 15: Printer Address Switch Settings

11.3.2 Supervision

Supervision includes proper operation of the SDI bus, proper connection of the printer cable between the printer and the D9131A, printer paper supply, printer selected (on-line), and printer power.

The panel sends an SDI failure report to the receiver if it fails to communicate with the printer interface, and `SERVC PRINTER` displays at the command center. The report to the receiver includes the address of the troubled D9131A to indicate which printer needs service.

If an SDI device is supervised and SDI A becomes disconnected, the device may still operate normally, depending upon environmental conditions.

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11.4 D9210B Wiegand™ Control Interface Module

The Radionics D9210B Wiegand™ Control Interface Module is a 4-wire powered device providing connections for an access door point and door strike. The D9412G can supervise eight Wiegand™ Control Modules, and the D7412G can supervise two. Each D9210B supports one door to control access. Programming allows each access door to be configured independently.

Using Wiegand™ style cards or tokens, the D9210B can allow access for up to 996 cards/tokens on the D9412G, 396 on the D7412G. User access authority can be configured to restrict access to certain doors or to certain periods of time. The reading of access cards, in addition to granting access, can control whether the system will disarm. Used with the D9412G, the D9210B recognizes 249 master users by user name, passcode, and access authority. The D9210B recognizes 99 master users when used with the D7412G. Each master user will support three sub-users with unique cards/tokens having the same access level as the master user.

Door Module	1	2	3	4	5	6
1	ON	ON	ON	*	ON	ON
2	OFF	ON	ON	*	ON	ON
D7412G maximum						
3	ON	OFF	ON	*	ON	ON
4	OFF	OFF	ON	*	ON	ON
5	ON	ON	OFF	*	ON	ON
6	OFF	ON	OFF	*	ON	ON
7	ON	OFF	OFF	*	ON	ON
8	OFF	OFF	OFF	*	ON	ON

* Fail Safe Mode (Switch 4)
ON = If SDI Bus Fails, relay energizes.
OFF = If SDI Bus Fails, relay de-energizes.
NOTE: Switches 5 and 6 MUST remain in the ON position.

Table 16: Access Control Module Address Switch Settings

11.4.1 Switch Settings

Switches on the D9210B assign a unique address (1 to 8) to each module. *Table 16* shows the correct switch setting for each D9210B address.

11.5 SDI Address 80

SDI Address 80 is available on the D9412G/D7412G panels and allows bi-directional SDI to RS232 information. The intent of this address is for use with home or building automation software. A D9133 Serial Interface Module is required for this application.

11.5.1 D9133 Serial Interface Module

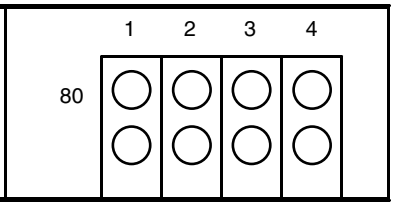
The Radionics D9133 Serial Interface Module is a four-wire powered SDI device providing connection for RS232 devices to the D9412G/D7412G panels. The D9133 uses a specific communication protocol that is provided upon request. Please contact Radionics Technical Support Monday through Friday from 5 AM to 5 PM Pacific Time at 800-538-5807.

The D9133 can be installed up to 1,000 ft. (305 m) away from the panel using 18 AWG wire. The D9133 is not UL Listed.

11.5.2 Address Settings

D9133 Serial Interface Module

There are no jumper settings required for the D9133 (SDI Address 80) for home or building automation purposes. All Jumper shunts must be removed for this setting.



11.5.3 Supervision

The supervision of the D9133 is available through programming which includes proper operation between the D9133 and the control panel.

If supervised and the D9133 does not respond to panel supervision polls, the panel sends an SDI failure report to the receiver if it fails to communicate with the D9133 and `SERVC SDI 80` displays at the command center. The report to the receiver includes the address of the troubled module to indicate which module needs service.

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11.6 SDI Address 88

SDI Address 88 is available with the D9412G/D7412G panels and is used for several different applications. When using SDI Address 88, only one of the listed devices may be connected at a time.

11.6.1 D9133DC Direct Connect Programming Module

The D9133DC Direct Connect Programming Module can be used to locally program the D9412G/D7412G panels. In addition to this, the D9133DC allows Diagnostics and History retrieval to be performed. The D9133DC is not UL Listed.

11.6.1.1 Connecting the D9133DC

1. Configure the D9133DC for SDI Address 88. To program the panel when the reset pin is in the unlocked position, program ***Enable SDI RAM*** to Yes in the RADXAUX1 handler.
2. Connect the D9133DC to Com Port 1 or Com Port 2 on the PC. The D9133DC has a DB-9 female serial connector. A null modem cable must be purchased separately to connect the D9133DC to a PC.
3. Using 22 AWG or 18 AWG wire, connect the D9133DC SDI terminals (SDI PWR, SDI A, SDI B, and SDI COM) to the panel's SDI terminals (Terminals 29 to 32).

To send or receive the panel's program, the Reset Pin can be in the Locked or Unlocked position.

Note: *Locking the Reset Pin when programming the panel improves upload/download time.*

11.6.1.2 Used as an External Modem

The D9133DC can also be used as an external modem when using RAM IV with the panel. Please see the *D9412G/D7412G Program Entry Guide* for programming details.

11.6.2 D9133TTL-E Network Interface Module

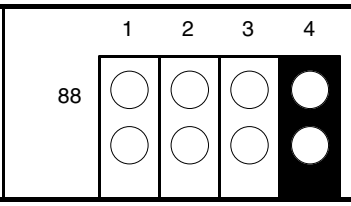
The Radionics D9133TTL-E Network Interface Module is a four-wire powered SDI device providing connection for bi-directional communication over Ethernet networks to D9412G/D7412G panels. For programming information on enhanced communications, please refer to the *D9412G/D7412G Program Entry Guide*.

The D9133TTL-E can be installed up to 1,000 ft. (305 m) away from the panel using 18 AWG wire.

11.6.3 Address Settings

D9133TTL-E Network Interface Module

A jumper must be placed over Pin 8 for the D9133TTL-E (SDI Address 88) to be used for RAM IV and/or enhanced communications in a LAN/WAN environment.



11.6.4 Supervision

Supervision of the D9133DC, D9133TTL-E, and D9133TTL-TR at SDI Address 88 is available through programming that ensures operation between the module and the control panel.

If supervised and the module does not respond to panel supervision polls, `SERVC SDI 88` displays at the command center. The report to the receiver includes the address of the troubled module to indicate which module needs service.

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Notes:

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12.0 Programmer and Accessory Connections

12.1 Programmer Connector

The procedure below shows how to connect and disconnect the programmer. Refer to the *D5200 Operation Manual* for complete information on using the D5200 programmer.

1. ***Lock Reset Pin:*** See *Figure 21*.
2. Connect the D5200 Data/Power cord into the programmer connector.
3. Perform the desired programming function (send or receive program).
4. Disconnect the programmer.

12.1.1 Programmer Access Reports

When a program is sent to the panel, the panel sends a `PROG ACCESS OK` report ten seconds after the handler is exited or when the programmer is disconnected. The prompt in Routing must be programmed YES for this report to be sent.

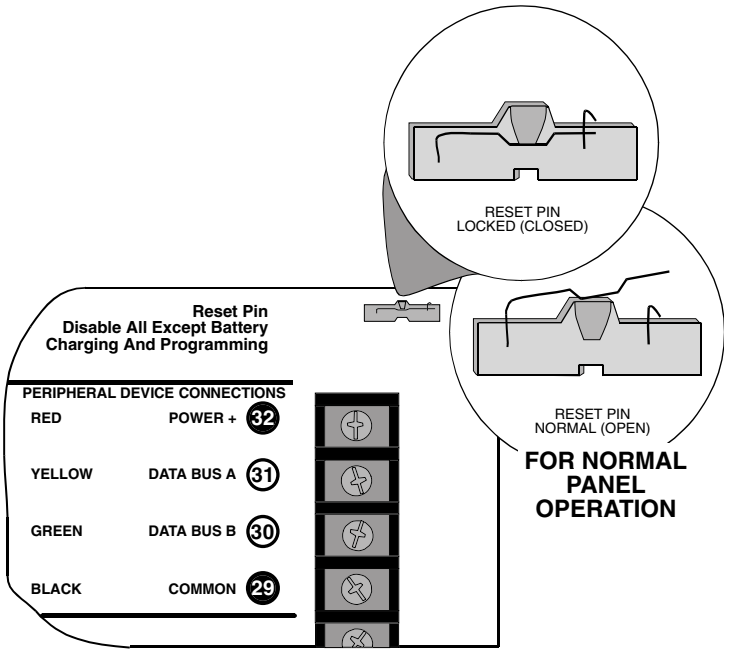

Figure 21: Reset Pin

12.2 Accessory Connector

Use the **Accessory Connector** to connect the panel to the D928 Dual Phone Line Switcher. The Accessory Connector is on the bottom right corner of the I/O board. See *Figure 22*. The D928 allows the panel to use two telephone lines to transmit reports.

See section *6.12 D928 Dual Phone Line Switcher* for installation and operating instructions.

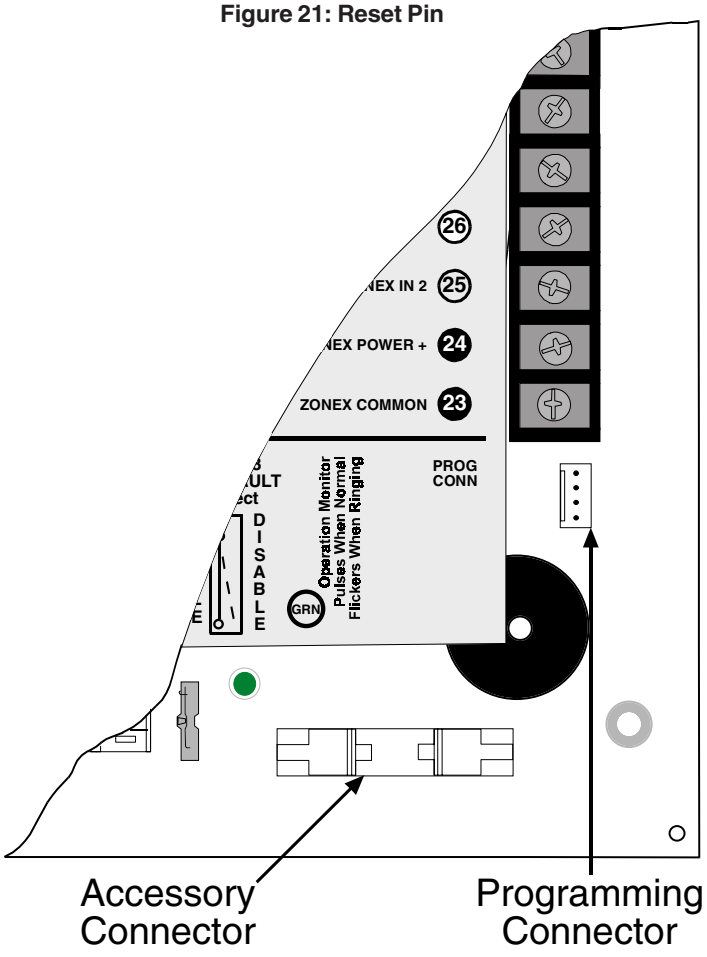

Figure 22: Programmer and Accessory Connections

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Programmer and Accessory Connections

Notes:

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13.0 Faceplates

13.1 D9412G Faceplate

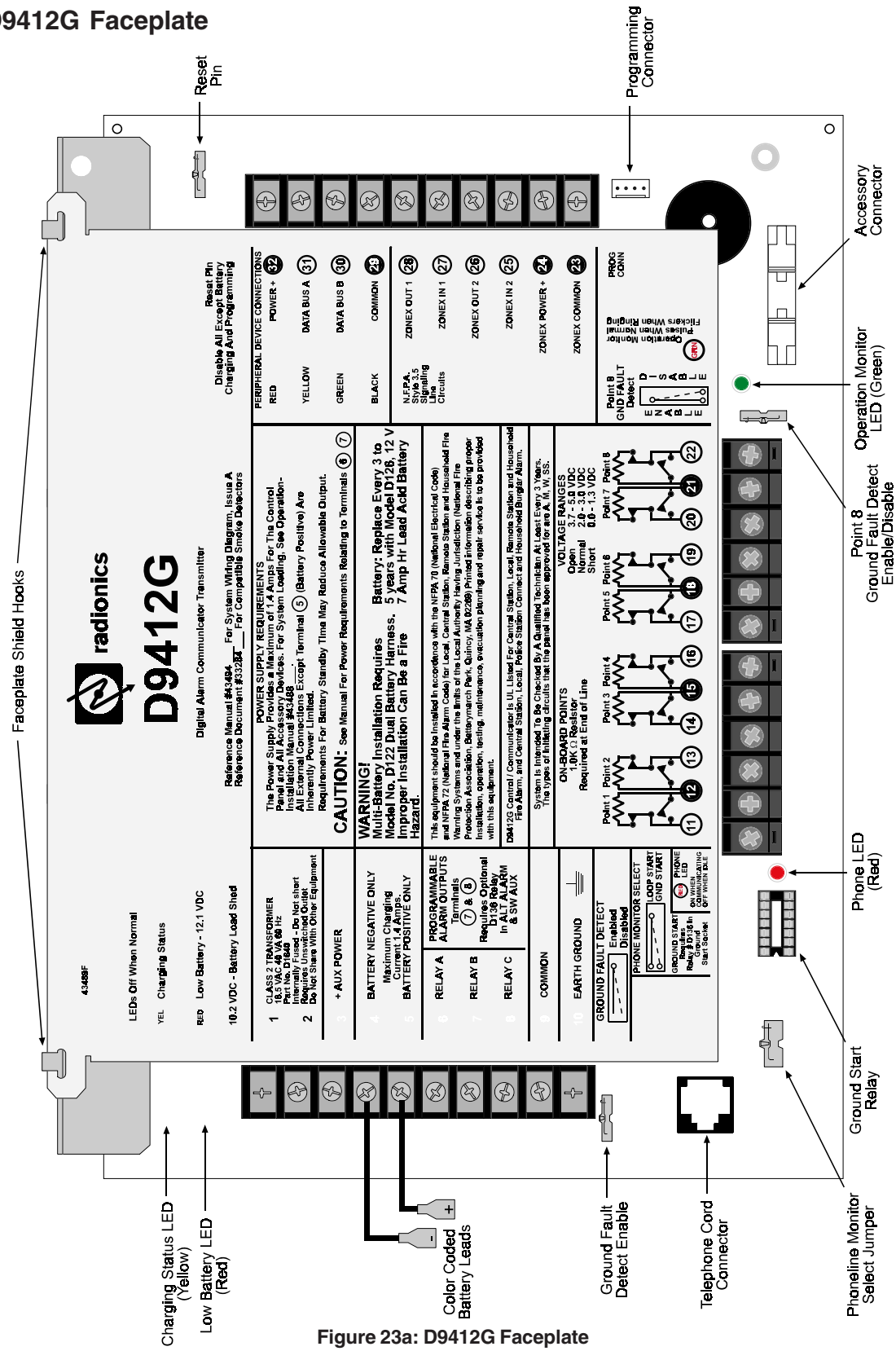
Reset Pin
Programming Connector
Accessory Connector
Faceplate Shield Hooks
Operation Monitor LED (Green)
Point 8 Ground Fault Detect Enable/Disable
Phone LED (Red)
Ground Start Relay
Charging Status LED (Yellow)
Low Battery LED (Red)
Color Coded Battery Leads
Ground Fault Detect Enable
Telephone Cord Connector
Phoneline Monitor Select Jumper
radionics
D9412G
Digital Alarm Communicator Transmitter
LEDs Off When Normal
YEL Charging Status
RED Low Battery - 12.1 VDC
10.2 VDC - Battery Load Shed
Disable All Except Battery Charging And Programming
PERIPHERAL DEVICE CONNECTIONS
POWER SUPPLY REQUIREMENTS
CAUTION: See Manual For Power Requirements Relating to Terminals
WARNING! Multi-Battery Installation Requires Battery: Replace Every 3 to 5 years with Model D126, 12 V 7 Amp Hr Lead Acid Battery
Improper Installation Can Be a Fire Hazard.
BATTERY NEGATIVE ONLY
Maximum Charging Current 1.4 Amps
BATTERY POSITIVE ONLY
+ AUX POWER
PROGRAMMABLE ALARM OUTPUTS Terminals 7 & 8
Requires Optional D126 Relay In ALT ALARM & SW AUX
RELAY A
RELAY B
RELAY C
COMMON
EARTH GROUND
GROUND FAULT DETECT
Enabled
Disabled
PHONE MONITOR SELECT
LOOP START
GND START
GROUND START Relay 2 (D126 Relay 3 D130 Ground Start Module)
PHONE LED
ON WHEN COMMUNICATING WITH PANEL
ON-BOARD POINTS 1.0K Ω Resistor Required at End of Line
VOLTAGE RANGES
Open 3.7 - 5.0 VDC
Normal 2.0 - 3.3 VDC
Short 0.0 - 1.3 VDC
Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8
N.F.P.A. Style 3.5 Signaling Line Circuits
ZONEX OUT 1
ZONEX IN 1
ZONEX OUT 2
ZONEX IN 2
ZONEX POWER +
ZONEX COMMON
PROG CONN
Point 8 GND FAULT Detect
ENABLE DISABLE
Operation Monitor Normal Pulses When Ringing Flickers When Communicating
RED YELLOW GREEN BLACK
POWER + DATA BUS A DATA BUS B COMMON

Figure 23a: D9412G Faceplate

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13.2 D7412G Faceplate

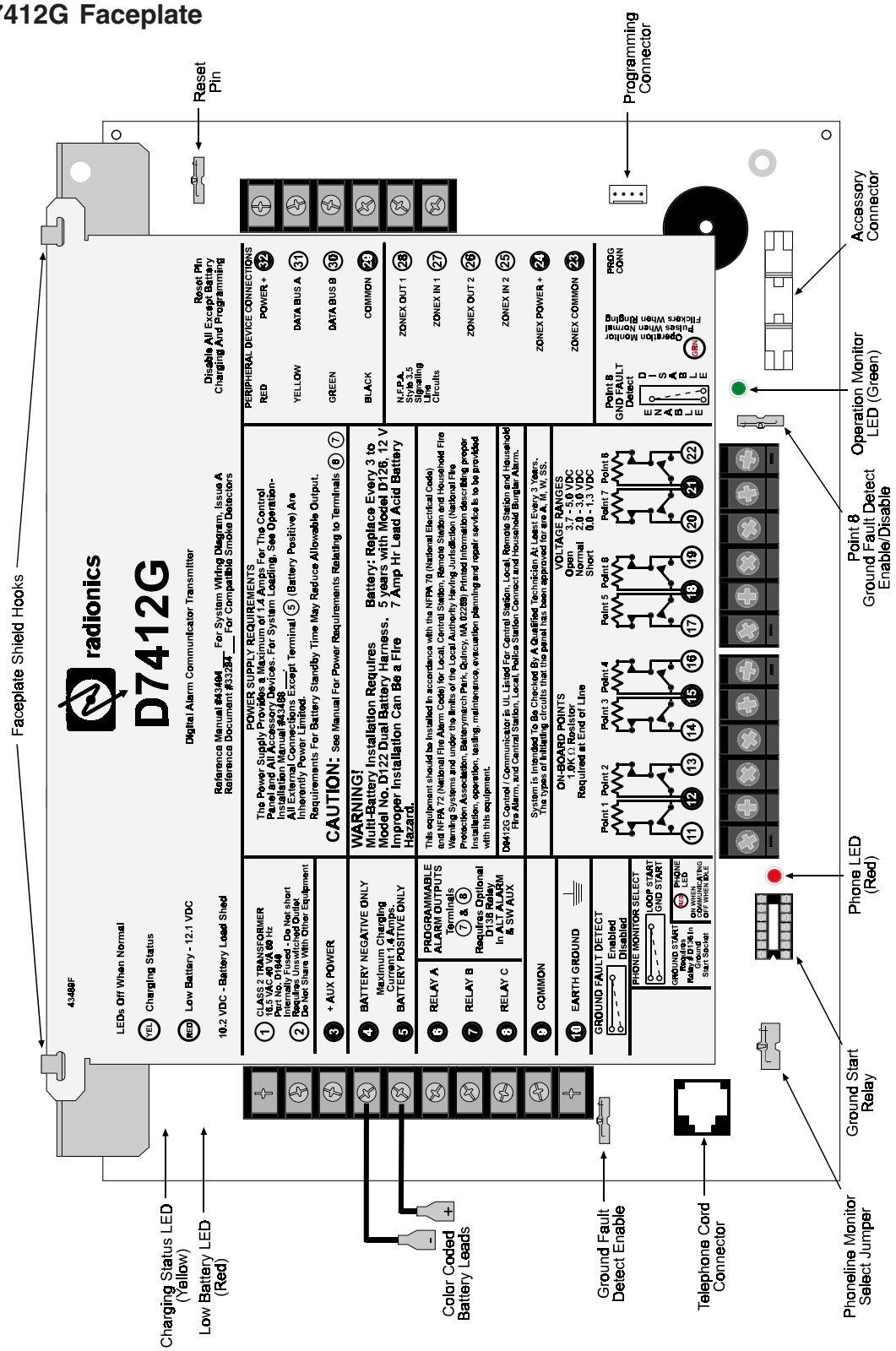
Reset Pin
Programming Connector
Faceplate Shield Hooks
Accessory Connector
Point 8 Ground Fault Detect Enable/Disable
Operation Monitor LED (Green)
Phone LED (Red)
Ground Start Relay
Phoneline Monitor Select Jumper
Charging Status LED (Yellow)
Low Battery LED (Red)
Color Coded Battery Leads
Ground Fault Detect Enable
Telephone Cord Connector
radionics
D7412G
Digital Alarm Communicator Transmitter
LEDs Off When Normal
Charging Status
Low Battery - 12.1 VDC
10.2 VDC - Battery Load Shed
CAUTION: See Manual For Power Requirements Relating to Terminals 6 7
WARNING! Multi-Battery Installation Requires Battery: Replace Every 3 to 5 years with Model D126, 12 V 7 Amp Hr Lead Acid Battery Improper Installation Can Be a Fire Hazard.
+ AUX POWER
BATTERY NEGATIVE ONLY
Maximum Charging Current 1.4 Amps.
BATTERY POSITIVE ONLY
RELAY A
RELAY B
RELAY C
PROGRAMMABLE ALARM OUTPUTS Terminals 7 & 8
Requires Optional D138 Relay In ALT ALARM & SW AUX
COMMON
EARTH GROUND
GROUND FAULT DETECT
Enabled
Disabled
PHONE MONITOR SELECT
LOOP START
GND START
GROUND START Relay Requires D130 In Ground Start Social
PHONE LED
ON WHEN COMMUNICATING OFF WHEN IDLE
PERIPHERAL DEVICE CONNECTIONS
POWER +
DATA BUS A
DATA BUS B
COMMON
ZONEX OUT 1
ZONEX IN 1
ZONEX OUT 2
ZONEX IN 2
ZONEX POWER +
ZONEX COMMON
PRDS CONN
Operation Monitor Pulses When Normal Flickers When Ringing
Point 8 GND FAULT Detect
ENABLE DISABLE
N.F.P.A. Style 5 Signaling Line Circuits
ON-BOARD POINTS 1.0K Ω Resistor Required at End of Line
VOLTAGE RANGES
Open 3.7 - 5.8 VDC
Normal 2.0 - 3.8 VDC
Short 0.0 - 1.3 VDC
Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8
11 12 13 14 15 16 17 18 19 20 21 22

Figure 23b: D7412G Faceplate

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Appendix A: System Wiring Diagrams, Issue A

A.1 D9412G Control/Communicator, 1 of 3

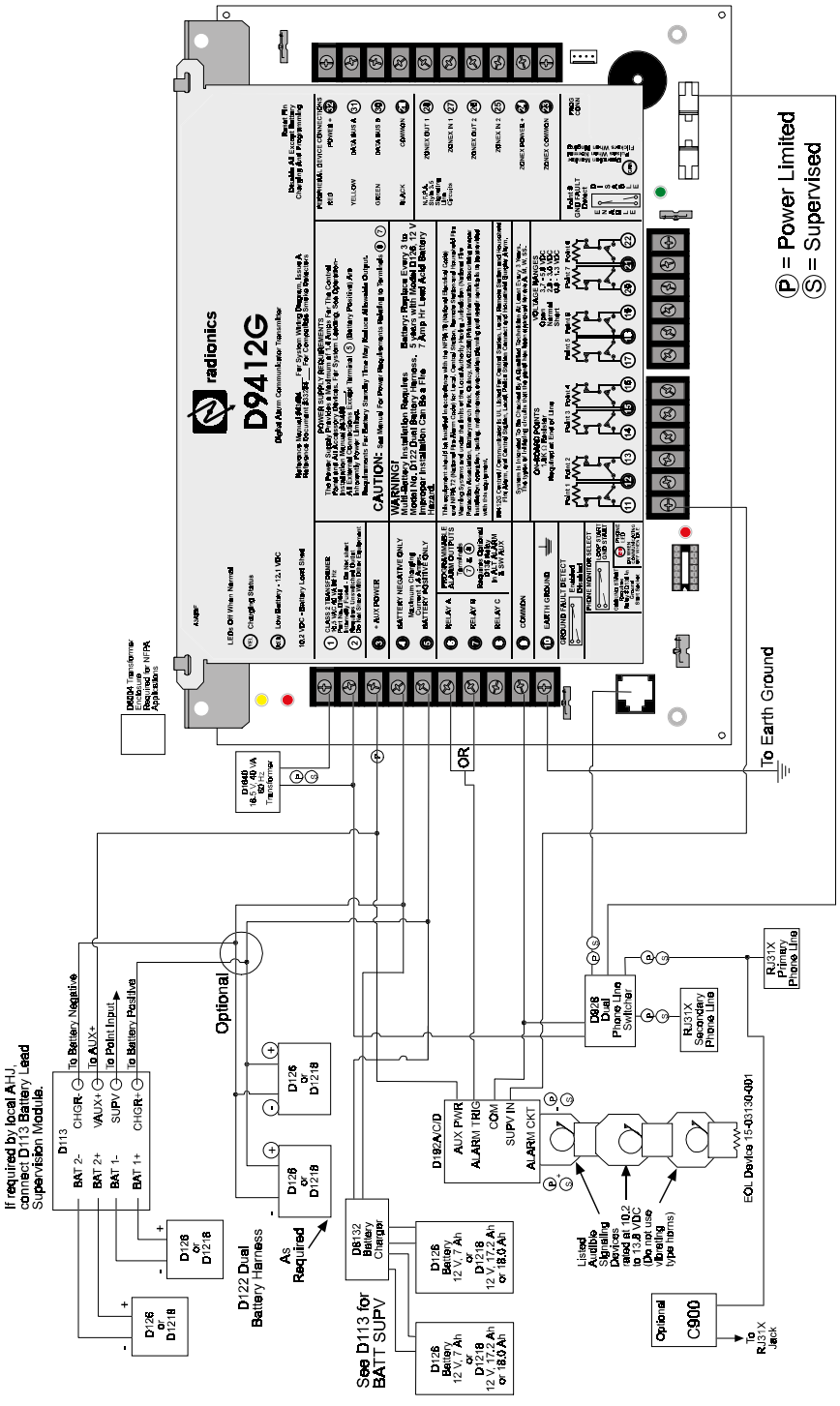

Figure 24a: D9412G System Wiring Diagram, 1 of 3

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A.2 D9412G Control/Communicator, 2 of 3

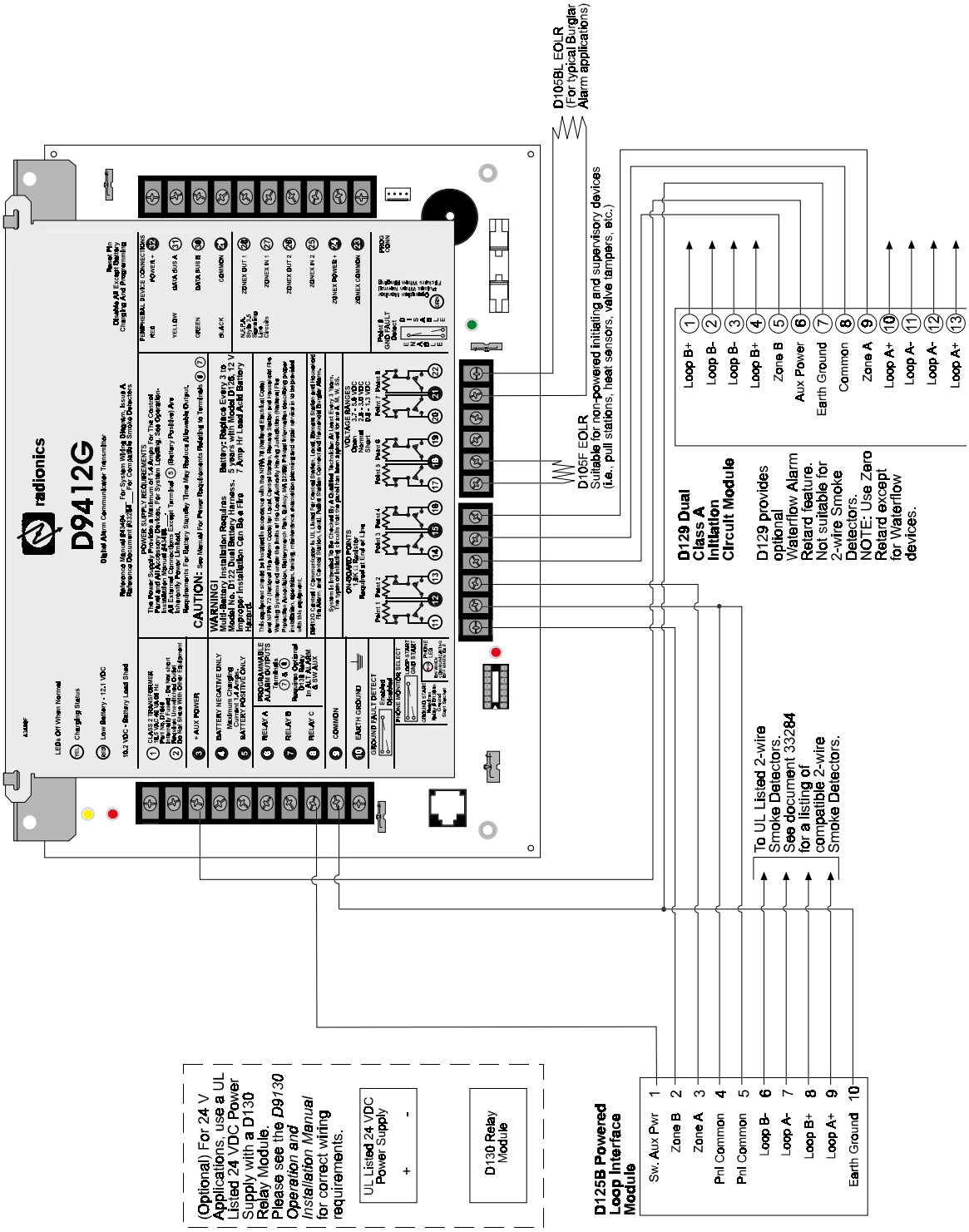
radionics
D9412G
D105BL EOLR
(For typical Burglar Alarm applications)
D105F EOLR
Suitable for non-powered initiating and supervisory devices
(i.e., pull stations, heat sensors, valve tampers, etc.)
D129 Dual Class A Initiation Circuit Module
D129 provides optional Waterflow Alarm Retard feature. Not suitable for 2-wire Smoke Detectors. NOTE: Use Zero Retard except for Waterflow devices.
Loop B+
Loop B-
Loop B-
Loop B+
Zone B
Aux Power
Earth Ground
Common
Zone A
Loop A+
Loop A-
Loop A-
Loop A+
To UL Listed 2-wire Smoke Detectors. See document 33284 for a listing of compatible 2-wire Smoke Detectors.
D125B Powered Loop Interface Module
Sw. Aux Pwr
Zone B
Zone A
Pnl Common
Pnl Common
Loop B-
Loop A-
Loop B+
Loop A+
Earth Ground
(Optional) For 24 V Applications, use a UL Listed 24 VDC Power Supply with a D130 Relay Module. Please see the D9130 Operation and Installation Manual for correct wiring requirements.
UL Listed 24 VDC Power Supply
+
-
D130 Relay Module

Figure 24b: D9412G System Wiring Diagram, 2 of 3

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A.3 D9412G Control/Communicator, 3 of 3

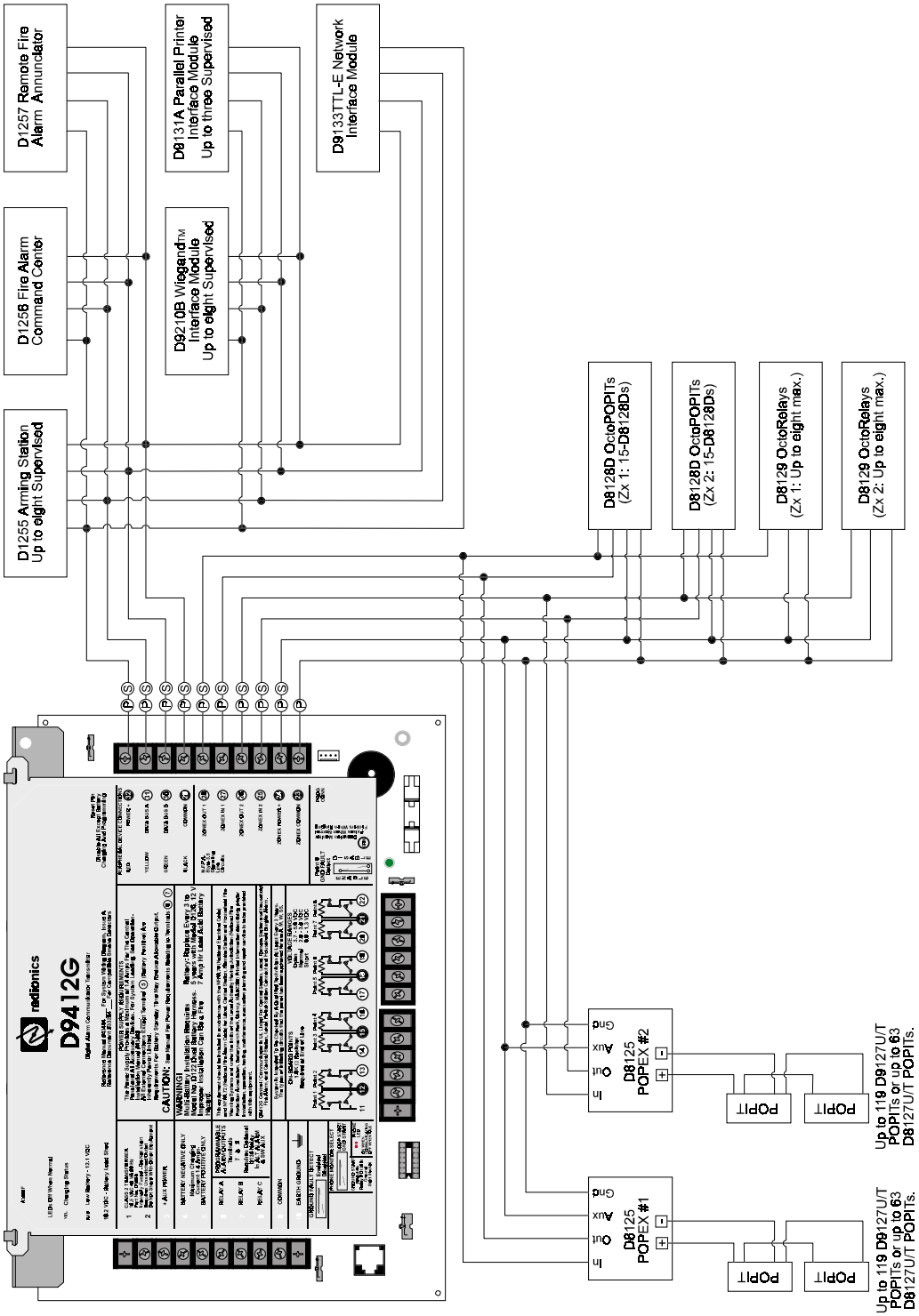
D1257 Remote Fire Alarm Annunciator
D1256 Fire Alarm Command Center
D1255 Arming Station Up to eight Supervised
D8131A Parallel Printer Interface Module Up to three Supervised
D9210B Wiegand™ Interface Module Up to eight Supervised
D9133TTL-E Network Interface Module
D8128D OctoPOPITs (Zx 1: 15-D8128Ds)
D8128D OctoPOPITs (Zx 2: 15-D8128Ds)
D8129 OctoRelays (Zx 1: Up to eight max.)
D8129 OctoRelays (Zx 2: Up to eight max.)
D9412G
radionics
D8125 POPEX #2
D8125 POPEX #1
In
Out
Aux
Gnd
POPIT
Up to 119 D9127U/T POPITs or up to 63 D8127U/T POPITs.
Up to 119 D9127U/T POPITs or up to 63 D8127U/T POPITs.

Figure 24c: D9412G System Wiring Diagram, 3 of 3

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Appendix A: System Wiring Diagrams, Issue A

A.4 D7412G Control/Communicator, 1 of 3

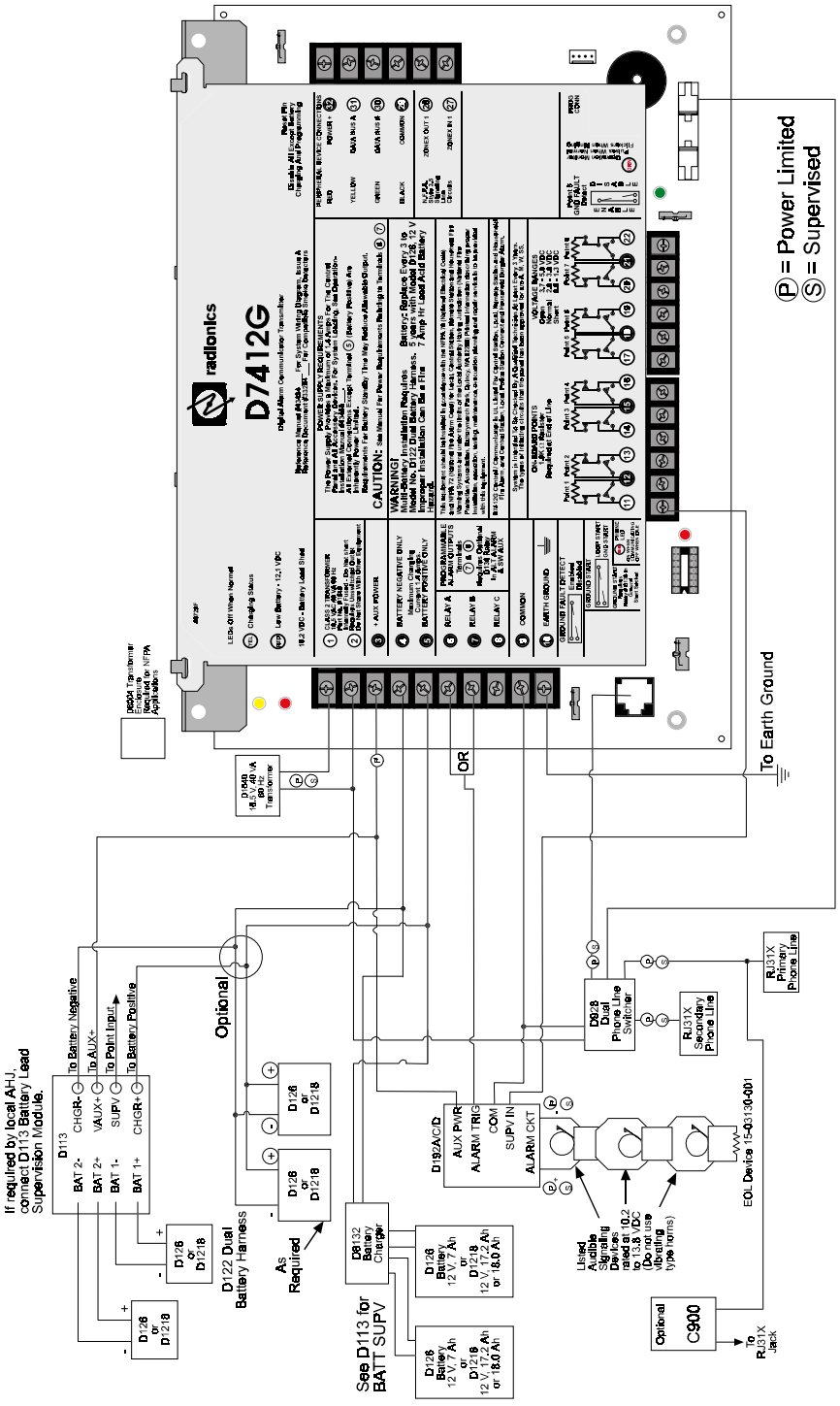

Figure 25a: D7412G System Wiring Diagram, 1 of 3

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A.5 D7412G Control/Communicator, 2 of 3

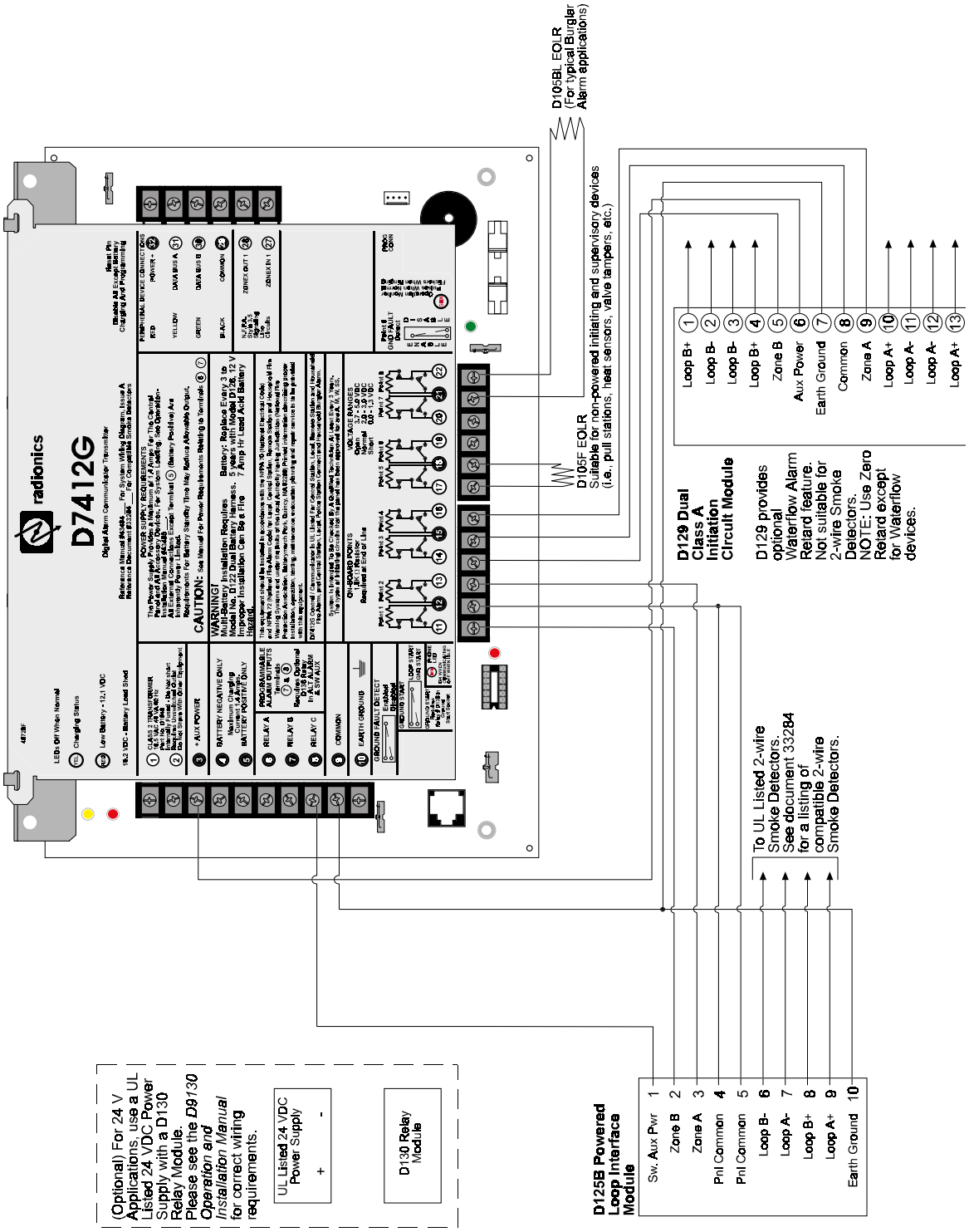
D7412G
radionics
D105BL EOLR
(For typical Burglar Alarm applications)
D105F EOLR
Suitable for non-powered initiating and supervisory devices (i.e., pull stations, heat sensors, valve tampers, etc.)
D129 Dual Class A Initiation Circuit Module
D129 provides optional Waterflow Alarm Retard feature. Not suitable for 2-wire Smoke Detectors. NOTE: Use Zero Retard except for Waterflow devices.
Loop B+
Loop B-
Loop B-
Loop B+
Zone B
Aux Power
Earth Ground
Common
Zone A
Loop A+
Loop A-
Loop A-
Loop A+
To UL Listed 2-wire Smoke Detectors. See document 33284 for a listing of compatible 2-wire Smoke Detectors.
D125B Powered Loop Interface Module
Sw. Aux Pwr
Zone B
Zone A
Pnl Common
Pnl Common
Loop B-
Loop A-
Loop B+
Loop A+
Earth Ground
(Optional) For 24 V Applications, use a UL Listed 24 VDC Power Supply with a D130 Relay Module. Please see the D9130 Operation and Installation Manual for correct wiring requirements.
UL Listed 24 VDC Power Supply
+
-
D130 Relay Module

Figure 25b: D7412G System Wiring Diagram, 2 of 3

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A.6 D7412G Control/Communicator, 3 of 3

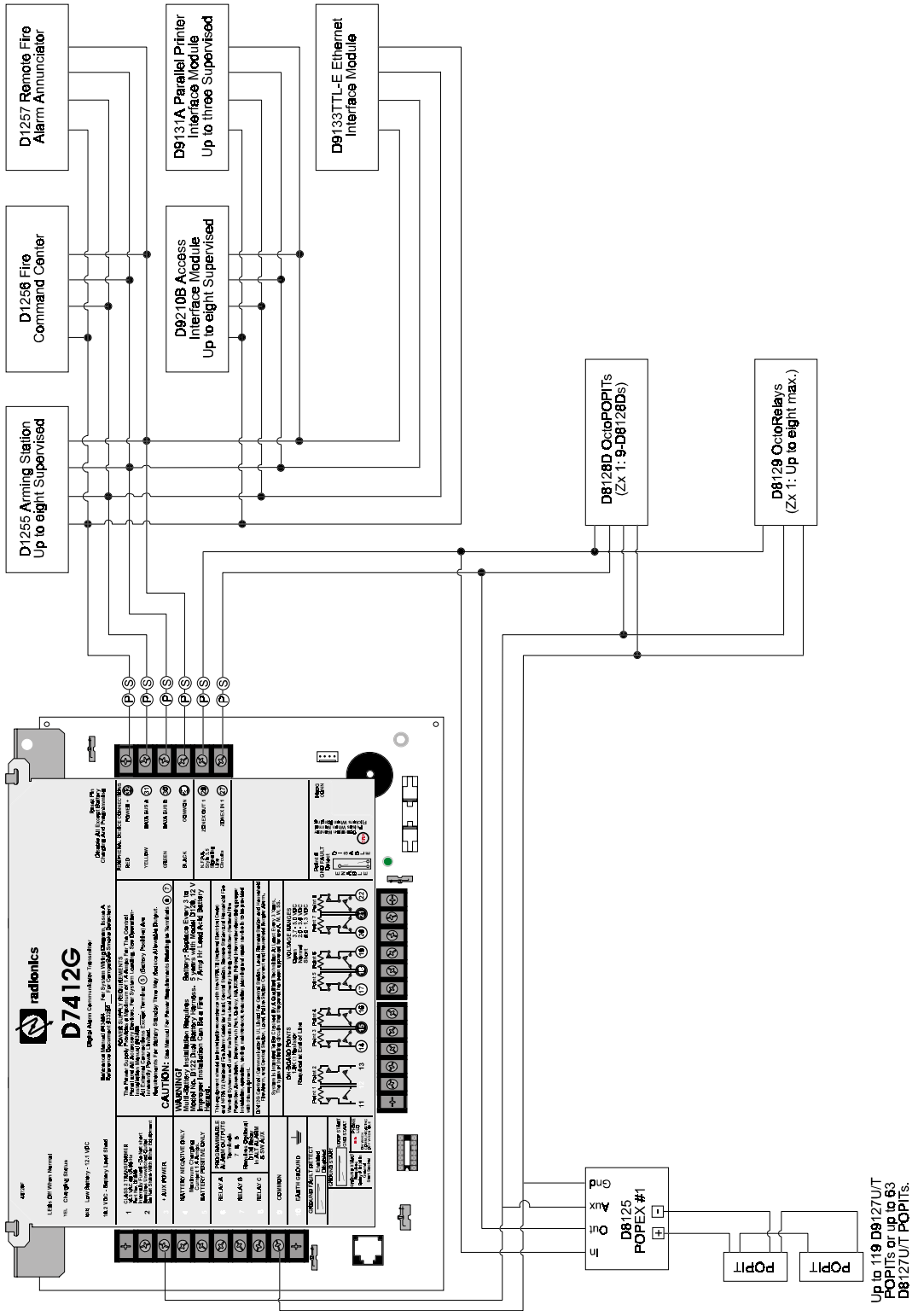
D1257 Remote Fire Alarm Annunciator
D9131A Parallel Printer Interface Module Up to three Supervised
D9133TTL-E Ethernet Interface Module
D1256 Fire Command Center
D9210B Access Interface Module Up to eight Supervised
D1255 Arming Station Up to eight Supervised
D8128D OctoPOPITs (Zx 1: 9-D8128Ds)
D8129 OctoRelays (Zx 1: Up to eight max.)
D7412G
radionics
D8125 POPEX #1
In
Out
Aux
Gnd
POPIT
POPIT
Up to 119 D9127U/T POPITs or up to 63 D8127U/T POPITs.

Figure 25c: D7412G System Wiring Diagram, 3 of 3

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Appendix B: Point Address Charts

B.1 ZONEX 1, Points 9 to 127 (D9412G); ZONEX 1, Points 9 to 75 (D7412G)

Place the labels on the base of the POPIT. Do **not** attach labels to the POPIT cover.

A number in the switch column indicates that the switch is set to ON.

D8127 or D9127 POPITs may be used for Points 9 – 72; however, **only** D9127 POPITs may be used for Points 73 – 127. D8127 POPITs have dipswitches 1 – 6, whereas D9127 POPITs have dipswitches 0 – 6.

	Switch						
Address	**0**	**1**	**2**	**3**	**4**	**5**	**6**
009	0	1	2	3	4	5	6
010	0	1	2	3	4	5	
011	0	1	2	3	4		6
012	0	1	2	3	4		
013	0	1	2	3		5	6
014	0	1	2	3		5	
015	0	1	1	3			6
016	0	1	2	3			
017	0	1	2		4	5	6
018	0	1	2		4	5	
019	0	1	2		4		6
020	0	1	2		4		
021	0	1	2			5	6
022	0	1	2			5	
023	0	1	2				6
024	0	1	2				
025	0	1		3	4	5	6
026	0	1		3	4	5	
027	0	1		3	4		6
028	0	1		3	4		
029	0	1		3		5	6
030	0	1		3		5	
031	0	1		3			6
032	0	1		3			
033	0	1			4	5	6
034	0	1			4	5	
035	0	1			4		6
036	0	1			4		
037	0	1				5	6
038	0	1				5	
039	0	1					6
040	0	1					
041	0		2	3	4	5	6
042	0		2	3	4	5	
043	0		2	3	4		6
044	0		2	3	4		
045	0		2	3		5	6
046	0		2	3		5	
047	0		2	3			6
048	0		2	3			

	Switch						
Address	**0**	**1**	**2**	**3**	**4**	**5**	**6**
049	0		2		4	5	6
050	0		2		4	5	
051	0		2		4		6
052	0		2		4		
053	0		2			5	6
054	0		2			5	
055	0		2				6
056	0		2				
057	0			3	4	5	6
058	0			3	4	5	
059	0			3	4		6
060	0			3	4		
061	0			3		5	6
062	0			3		5	
063	0			3			6
064	0			3			
065	0				4	5	6
066	0				4	5	
067	0				4		6
068	0				4		
069	0					5	6
070	0					5	
071	0						6
072	0						
073		1	2	3	4	5	6
074		1	2	3	4	5	
075		1	2	3	4		6
076		1	2	3	4		
077		1	2	3		5	6
078		1	2	3		5	
079		1	2	3			6
080		1	2	3			
081		1	2		4	5	6
082		1	2		4	5	
083		1	2		4		6
084		1	2		4		
085		1	2			5	6
086		1	2			5	
087		1	2				6
088		1	2				

	Switch						
Address	**0**	**1**	**2**	**3**	**4**	**5**	**6**
089		1		3	4	5	6
090		1		3	4	5	
091		1		3	4		6
092		1		3	4		
093		1		3		5	6
094		1		3		5	
095		1		3			6
096		1		3			
097		1			4	5	6
098		1			4	5	
099		1			4		6
100		1			4		
101		1				5	6
102		1				5	
103		1					6
104		1					
105			2	3	4	5	6
106			2	3	4	5	
107			2	3	4		6
108			2	3	4		
109			2	3		5	6
110			2	3		5	
111			2	3			6
112			2	3			
113			2		4	5	6
114			2		4	5	
115			2		4		6
116			2		4		
117			2			5	6
118			2			5	
119			2				6
120			2				
121				3	4	5	6
122				3	4	5	
123				3	4		6
124				3	4		
125				3		5	6
126				3		5	
127				3			6
128*							

** The panel reserves Point 128 for internal use.*

Table 17: ZONEX 1 Point Address Chart

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Appendix B: Point Address Charts

B.2 ZONEX 2, Points 129 to 247 (D9412G Only)

Place the labels on the base of the POPIT. Do **not** attach labels to the POPIT cover.

A number in the switch column indicates that the switch is set to ON.

	Switch								Switch								Switch							
Address	0	1	2	3	4	5	6	Address	0	1	2	3	4	5	6	Address	0	1	2	3	4	5	6
129	0	1	2	3	4	5	6	169	0		2		4	5	6	209		1		3	4	5	6
130	0	1	2	3	4	5		170	0		2		4	5		210		1		3	4	5	
131	0	1	2	3	4		6	171	0		2		4		6	211		1		3	4		6
132	0	1	2	3	4			172	0		2		4			212		1		3	4		
133	0	1	2	3		5	6	173	0		2			5	6	213		1		3		5	6
134	0	1	2	3		5		174	0		2			5		214		1		3		5	
135	0	1	1	3			6	175	0		2				6	215		1		3			6
136	0	1	2	3				176	0		2					216		1		3			
137	0	1	2		4	5	6	177	0			3	4	5	6	217		1			4	5	6
138	0	1	2		4	5		178	0			3	4	5		218		1			4	5	
139	0	1	2		4		6	179	0			3	4		6	219		1			4		6
140	0	1	2		4			180	0			3	4			220		1			4		
141	0	1	2			5	6	181	0			3		5	6	221		1				5	6
142	0	1	2			5		182	0			3		5		222		1				5	
143	0	1	2				6	183	0			3			6	223		1					6
144	0	1	2					184	0			3				224		1					
145	0	1		3	4	5	6	185	0				4	5	6	225			2	3	4	5	6
146	0	1		3	4	5		186	0				4	5		226			2	3	4	5	
147	0	1		3	4		6	187	0				4		6	227			2	3	4		6
148	0	1		3	4			188	0				4			228			2	3	4		
149	0	1		3		5	6	189	0					5	6	229			2	3		5	6
150	0	1		3		5		190	0					5		230			2	3		5	
151	0	1		3			6	191	0						6	231			2	3			6
152	0	1		3				192	0							232			2	3			
153	0	1			4	5	6	193		1	2	3	4	5	6	233			2		4	5	6
154	0	1			4	5		194		1	2	3	4	5		234			2		4	5	
155	0	1			4		6	195		1	2	3	4		6	235			2		4		6
156	0	1			4			196		1	2	3	4			236			2		4		
157	0	1				5	6	197		1	2	3		5	6	237			2			5	6
158	0	1				5		198		1	2	3		5		238			2			5	
159	0	1					6	199		1	2	3			6	239			2				6
160	0	1						200		1	2	3				240			2				
161	0		2	3	4	5	6	201		1	2		4	5	6	241				3	4	5	6
162	0		2	3	4	5		202		1	2		4	5		242				3	4	5	
163	0		2	3	4		6	203		1	2		4		6	243				3	4		6
164	0		2	3	4			204		1	2		4			244				3	4		
165	0		2	3		5	6	205		1	2			5	6	245				3		5	6
166	0		2	3		5		206		1	2			5		246				3		5	
167	0		2	3			6	207		1	2				6	247				3			6
168	0		2	3				208		1	2					248*							

** The panel reserves Point 248 for internal use.*

Table 18: ZONEX 2 Point Address Chart

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Index

A

Access Control *17*, 58
  Standard Features *17*
Accessories *15*
Accessory Connector *61*
Accounts
  Standard Features *16*
Address Settings
  SDI Devices *58*, *59*
Ademco AB-12 Bell/Housing 38
Approvals
  Standard Features *19*
Areas
  Standard Features *16*
Arming Devices *53*

B

Batteries 23, 25
  Charging Circuit *27*
  Charging Status and Low Battery LEDs *28*
  Discharge/Recharge Schedule ... *28*
  Replacement 26
  Supervision 27
Bell/Housing
  Ademco AB-12 ..... *38*
Buses
  SDI 29, 34, *54*, 57
  ZONEX 29, 39, 49, 71

C

Called Party Disconnect *34*
Cautions and Warnings *11*
Circuit Protection 29
Command Center Terminals *53*
Command Centers *17*, *23*, *43*, *53*
  CALL FOR SERVICE 22
  Standard Features *17*
  Wiring 23
Communication Failure 34
  LED *36*
Communicator
  Standard Features *16*
Compatible Accessories *15*
Components
  Ordered Separately *18*
Control/Communicator Assembly *18*

D

D1218 Battery *25*
D125B 44, 45
D129 ..... 44, 45
D268/D269 Independent Zone Control *54*
D279A Independent Zone Control ... *54*
D5200 Programmer *17*, *24*
D7412G
  Faceplates *64*
  System Wiring Diagrams, Issue A *68*
  Wiring Diagram *68*, *69*, *70*
D811 Arm Status Relay Module *51*
D8125 POPEX
  Connecting to the D7412G *41*
  Connecting to the D9412G *40*
  Installing *42*
D8125 POPIT Modules *39*
D8127 POPIT Modules *39*
D8128D OctoPOPIT *44*
  Connecting to the D7412G *48*
  Connecting to the D9412G *47*
D8129 OctoRelay *49*
D9127 POPIT Modules *39*
D9210B Wiegand Control Interface . *58*
D928 Dual Phone Line Switcher *35*
D9412G
  Faceplates *63*
  System Wiring Diagrams, Issue A *65*
  Wiring Diagram *66*, *67*
D9412G/D7412G
  Differences Between *13*
  New Features *16*
Debounce Count *37*
Discharge/Recharge Schedule *28*
Documentation Conventions *10*

E

Earth Ground *16*, *22*, 25
  Connecting *22*
EMI
  Lightning Transient Protection *18*
Enclosure Options *21*
  Transformer *25*
EOL Resistors 37, 43
Ethernet Networks *59*
Event Log
  Standard Features *17*
Event Memory
  Standard Features *17*

F

Faceplates
  D7412G *64*
  D9412G *63*
FCC
  Registration Number 33
FCC Rules *11*
Fire System Power Formula *29*, *30*

G

Ground Fault *16*, 22
  Detect *16*, *22*
Ground Start 23, 35

I

Installation *21*
  Enclosure Options *21*
Installing the Assembly *22*

K

Keyswitch *53*, *55*
  Standard Features *17*

L

LEDs
  AC Power Status *36*
  Charging Status *24*, 27, *28*
  Communication Failure *36*
  D928 Status 36
  Low Battery *27*, *28*
  Operation Monitor 27, 34
  Phone 33
  Phone Line Status *36*
Listings
  UL
    Central Station Burglary Alarm .. 44
    Household Burglary Alarm 44
    Local or Police Connected Burglary Alarm 44
Listings and Approvals *19*

N

NetCom Functionality *16*
Network Interface Module *59*
Networks
  Ethernet *59*
New Features *16*
Notes, Cautions and Warnings *11*

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Index

O

OctoPOPITs 23, *44*
  Mounting *45*
  Testing 46
  Wiring 45
OctoRelays 23, 49
  Wiring 51
Off-board Points *16*, *39*
Off-board Relays *49*
On-board Points *16*, *23*, *37*

P

Phone Cords 33, 36
Phone Lines 23, 33
  Dialing Format 34
  Dual Phone Line Switcher 35
  Ground Start *35*
  Jacks *16*, *33*
  Phone Line Monitor *34*
  Rng Indicator *34*
  Seizure *16*, *33*
  Status LED *36*
Point Address Charts *71*
  ZONEX 1 ..... *71*
  ZONEX 2 ..... *72*
Point Chart Label *24*
  Installing *24*
Points *16*
  Off-board *16*, *39*
  On-board *16*, *23*, *37*
  Sensor Loops *37*
  Standard Features *16*
POPEX 23, 39
  Wiring 42
POPITs 39, 42
  Testing 46
  Wiring 23, 42
Power
  AC Power Status LED *36*
  Auxiliary 29
  Continuous Current Draw 29
  Primary *25*
  Programmable Terminals 29
  Secondary *25*
  Total Available 29
Power Failure 25
Power Module
  Battery Discharge Schedule *28*
  Charging Status LED *28*
  Replacing Batteries *26*
Power Outputs
  Alarm *29*
  Alternate Alarm *29*
  Auxiliary *29*
  Circuit Protection *29*
  Continuous Power Outputs Terminals *29*
  Fire System Power Formula *30*
  Programmable *29*
  Programmable Power Outputs Terminals *29*
  Switched Auxiliary *29*
  Total Available Power *29*
  ZONEX *29*
Power Supply *25*
Primary Power Terminals *25*
Printer 57
Programmer 24
  Connecting 61
Programmer Connector *61*
Programming
  Standard Features *18*
Programming the Panel *24*

R

RAM IV *18*, *24*
Related Documentation *10*
Remote Account Manager *18*, 24
Replacing Batteries *26*
Reports *24*
  Transmission *16*
  Watchdog Reset *27*
Reset *22*, *24*, *31*, *59*
  Watchdog *23*, *27*, *36*
Reset Pin *22*
Ringer Equivalence 33
Rng Indicator *34*
RS232 ..... *58*

S

SDI Address 80 ..... *58*
SDI Address 88 ..... *59*
SDI Bus *54*, *57*
SDI Devices *58*, *59*
  Installing *57*
Secondary (DC) Power *25*
Secondary Power Terminals *25*
Sensor Loops *37*
Serial Interface Module *58*
Service Walk Test *24*
Specifications *14*
Standard Features *16*
System Overview *13*
System Wiring Diagrams, Issue A ... *65*

T

Telephone Connections *23*, *33*
Testing
  Off-board Points *46*
  Service Walk 24
Testing the System *24*
Tips, Notes, Cautions & Warnings .. *11*
Transformer 23, 25
Transformer Enclosure *25*
Type Styles *10*

V

Verification/Reset Relay *31*

W

Warnings *11*
Watchdog Feature *36*
Wiring 23
  Command Centers 23
  D8125 POPEX 42
  D928 Dual Phone Line Switcher . 36
  Detection Devices 23
  Diagrams 65
  OctoPOPITs 45
  OctoRelays 51
  On-board Points 37
  POPITs 23, 42

Z

ZONEX 1
  Point Address Charts *71*
ZONEX 2
  Point Address Charts *72*
ZONEX bus *49*

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Notes:

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